Risk and Socio-technical Systems:
A study of the Taiwanese
Campus Accident Reporting System

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Abstract

The main purpose of my thesis is to examine the processes and problems of risk governance within the functioning of a socio-technical system in a hierarchical organization. I explore the actual problems of operators of the Campus Security Report System and the solutions they deploy as different groups of people. The thesis examines the governance of risk-related events as found within people's daily life drawing on culture theory, risk society and risk management approaches, and attempts to evaluate the relationships between risk, risk management and organisational culture. The research starts from the exposition of risk management ideas, focused on the daily risks happening in schools precisely because they are 'everyday', often quite mundane, yet potentially posing as much organisational challenge as major disasters which can, quite literally, cause organisational collapse.

The thesis focuses not only on the concept of culture theory to explore the interaction of risk management existing across an organisational culture but also relies on the ideas of the Social Construction of Technology (SCOT) approach to explore the dynamic of managing daily risks in a hierarchical organisation. The main areas to focus on are:

- Explore how unpredictable risks are managed
- Examine the ways in which systems are modified in response to changing risk
- Examine the ways in which managers and users interact and how hierarchical and local cultural practices work together or in different directions
- Examine what are seen as hard to control risks and how these are reported
- Examine the play of groups and their interests in shaping the system and how problems are dealt with
- Examine the relationship between leaders/designers and users of the system and how this shapes the acceptability of risk.

My thesis suggests that if managers ignore the factor of culture to manage risk, even with the help of technology, they may not only experience the reduplication of risk but also create new risks for an organisation or managers once again. In order to avoid such unacceptable phenomena when governing risk one of the possible ways may be to rely on the functioning of SCOT as a process, this would probably effectively empower the socio-technical system's ability to manage risk in a more socially robust way in risk society.

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York, June 2011

Declaration

I declare that the content of this thesis is my own work and that has not been submitted in any form for the award of a higher degree elsewhere. I also confirm that any quotation or paraphrase from the published or unpublished work of another person has been duly acknowledged in this work which I present for examination.

Bao Chuang Huang

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Chapter 1: Introduction

1.1 Introduction

From ancient to modern technological society, human history is closely related to risk. Risk situations are like a catalyst in chemistry, a virus in a computer or bacteria in medicine. Sometimes they cause a negative influence for processes of experiment, undermine system functions or harm bodies. However, they may have a positive function in enabling a stable reaction of an experiment, an anti-virus for a defense system or antibiotics for the protection of health. From a historical point of view, sometimes risk may mark a new milestone for society. In ancient society people accumulated knowledge from life experience. The ancient Chinese, for example, used to deploy astronomy to do the weather forecasts and develop twenty four solar terms in accordance with cultivation practices to predict the harm to crops from adverse weather. In ancient Egypt, people built a foundation for civilization in the Nile valley where flooding happened every year for thousands of years. Flooding was one of the threats to residents' lives and property caused by the Nile River but it provided fertile mud for cultivation. Such natural disasters not only bring losses for human society, but also provide an opportunity for society to learn from the experience and lessons of history.

Sometimes risks may appear repeatedly. Although people have learned how to reduce the loss coming from risks by learning from history, the possible disaster coming after risks cannot be eradicated. How to efficiently predict risks to prevent disaster is of vital importance. For example, there is a paragon story about an event that happened thousands of years ago in ancient China. A man called Yu was assigned by the Emperor to harness the flooding of the Yellow River in the middle of China. He worked too hard to go home and even passed by his home three times. No matter how industrious he was, the flooding caused by the Yellow River still remained from far ancient time to present days. A similar situation also appears in the UK, there were 37 flood events in Yorkshire, from 1315 to 1968 (Radley & Simms 1970:10). Though science and technological research has the highest reputation and achievement in the UK, the flood could not be eradicated, completely. From a historical point of view, risks with similar characteristics

may cause the same problems in any societies, whether in east or west. Therefore, if people cannot avoid the risk around them, one of the best ways to cope with risk may be to combine knowledge from historical records or to rely on the calculation abilities of modern technologies to alleviate some potential harm from risks.

Nowadays most governments or organisations rely on technology to manage or prevent risks including natural and man-made ones, such as typhoons, hurricanes and tsunami forecasts, the control of global warming, management of nuclear power plants and earthquakes, terrorist identification and monitoring systems, infectious disease prevention and rail track management. However, technology may itself be the source of some risks for society, such as the 911 event in the USA, in which the planes hijacked by terrorists became their weapons. It was a similar situation in regard to the terrorist attack in India in 2008, where terrorists aimed at their target through the use of 'Google Earth'. In addition, when bureaucratic organizations rely on some technologies such as Closed Circuit Television CCTV to govern risk, while government may save on manpower and other costs in making risk-prevention policies (Pollock and Williams 2009: 20) at the same time they may face a dilemma in regard to compromising human rights through surveillance. Another example may be worth noting: the massive 8.9 magnitude earthquake struck off Japan on 11 March 2011 and the Japanese government notified its citizens on mobile phones through a message system which gave an extra fifteen to thirty seconds for citizens to escape. On the one hand, technology here provided a highly effective function to warn people about risks providing a bridge between government and public (Loader 1998: 6). On the other hand, this powerful earthquake not only caused huge damage and loss to citizens and property but also created another disaster (a tsunami); as a result, the tsunami destroyed the Fukushima Nuclear Power Plant which has caused new socio-technical risks to government, the private corporations involved and to citizens in risk society.

Significantly, each risk-related event may bring or be followed by some hazards or harm for societies. On the one hand, if people ignore the hazards coming from those events, they may cause new risks for individuals, organization or society. Moreover, if the damage from risks cannot be reduced or prevented, they may create a negative condition which may be a potential risk at the end of the event itself. On the other hand, any disaster may cause some risks, and every risk also could create some hazards for organisations or societies as well. Therefore, how to govern risk-related events and

identify the relationships between risks, risk management and organisational culture are the major purposes of this doctoral thesis. The next section will describe how and why the researcher developed the concept of the thesis.

1.2 The concept of the thesis

Risk pervades daily life and social science research at the end of the twentieth century and beyond has become increasingly focused upon it. The nature, sources and impact of risks are seen to vary and different perspectives provide different analyses of risk and its meaning. Some focus on more psychological, others cultural, yet others organisational processes that can be linked to risk. My research is not interested in major global issues such as climate change that require international collaboration to manage them; rather, my thesis is more concerned with the exploration of the actual risks which happen in people's daily life primarily among young people, regarded by some governments as 'risky', as potential sources of 'danger' or 'trouble' and so in need of some forms of social regulation and oversight (Mitchell et al 2004: 1). The thesis focuses on the risks associated with actual or potential campus security events that have caused harm to individuals (student or staff), schools (the loss or damage of property) or wider society (e.g. the potential threats from infectious disease on campus) in Taiwan. Such events at high school are considered to carry the status of chronic, frequent and regular risk, because they may happen in every day, each week or month or potential threats that need to be prevented. What is sociologically interesting is that they still happen at any time even under formal governance regimes.

I explore the viewpoints of the designers and operators of an IT-based system known as the Campus Security Reporting System (CSRS), which are collected from respondents found in different levels of the system based upon the importance of seeing different interests and perspectives in defining risk and using the system, as suggested by the social construction of technology (SCOT) approach. Bijker et al (1989: 28) highlight 'the developmental process of a technological artifact is described as an alternation of variation and selection'. The structure of the CSRS is built on an information technology (IT) system which relies on the creation and use of a national digital-database to link the relationships between the system designers/managers and operators/users. I explore the actual problems of operators of the CSRS and the solutions they deploy as different groups of staff, which included the system designers,

government managers, policy practitioners and regional/local operators. The CSRS was built by the educational system which I argue can be characterised as a hierarchical organisation which expresses a high grid/group culture, a concept I draw from Mary Douglas' work. There are four management levels among the government, local government and school. My thesis therefore not only explores the dynamic between the designers/managers and operators/users, but also seeks to understand the possible problems that they experience and the solutions they find to deal with them.

1.3 The structure of the thesis

My thesis tries to find out what are the different perceptions among those handling the campus security events and in operating the CSRS between local school managers who are the system operators and governmental managers who are the system designers/managers. The research adopts a mixed-methods approach, including the use of a case study, quantitative research, qualitative research, longitudinal research (in relation to reviewing and assessing long-term secondary data sources) and interviews. This thesis compares the opinions and experiences of operators who manage or operate the technological system with a three part case study which includes the analysis of the database of the CSRS in Taiwan, a questionnaire survey with operators' about the CSRS and face to face interviews with the system operators and managers.

Research concentrated on the management function of risks in a hierarchical organization which handles all security events that happen at schools around the country. The first part of the case study focuses on access I secured to the five year database of the CSRS from 2004 to 2008. The second part of the case study addresses on the staff attitudes operating the CSRS. The purpose of this part of the research is to explore the attitudes of school managers in risk management, and to discover the relationship between formal procedures they are expected to follow and what actual practice takes place when dealing with risk events at school. Finally, the third dimension of my case study moves onto analysing more specific opinions from the local operators or managers at schools in some cities in Taiwan, as well as the system designers and more senior managers within government departments. The research in this part focuses on the personal knowledge of governing risk events and the function of the CSRS. The research tries to distinguish differences between the local and government managers in using or managing the Campus Security Report Centre CSRC. My thesis attempts to

understand the dynamics of risk management through comparative research. Also, it hopes to explore the relationship between organizational culture and personal attitudes in dealing with risks; and to discover what, using a phrase from Nowotny' (2000: 117) one might call a 'socially robust' approach towards effective risk governance.

1.4 The purpose of research

Different organisations, cultures, societies and countries may develop multiple systems and skills to monitor or manage both visible and invisible risks. As Nowotny (ibid) points out, however, scientists design possible ways to deal with any potential or real risks, but need to develop a form of reliable knowledge about risk that fits the needs of citizens, their cultures and the customs of society. If the need is secured, a form of risk governance based on "socially robust knowledge" can be achieved. The aim of my thesis is not to judge the moral issues of risk management, but to explore how such a system works in a modern technological society; and within this context a society that regards technology as providing a means through which social ordering and the management of risk can be enabled. Therefore, I focus on a socio-technical management system, which is designed by a governmental agency, relying on modern technology to identify, integrate and manage the phenomena of risks and 'accidents' occurring in everyday life on schools and colleges in Taiwan. Campus security events may appear frequently on every day; some are likely to appear randomly over few weeks or months; most of them cause slight injury for students or staff on or off the campus; however, sometimes they may cause serious harm to them or loss of campus property in the school.

Thus, in the thesis I will examine the governance of risk-related events as found within people's daily life drawing on culture theory, risk society and risk management approaches; and attempt to evaluate the relationships between risk, risk management and organisational culture. The campus reporting system was developed by the educational institutions in Taiwan, though the operational function and experience of the system may provide many useful information and examples for similar regimes which seek to govern risks in the socio-technical society. Therefore, this thesis tries to examine and critique risk management practice and works towards a model that can be used to integrate more effectively functions to improve the governance of socio-technical risk.

1.5 Overview of the thesis

This first chapter describes how I built the concept of the thesis and how I have created the structure of thesis through the linking of three case studies. Also, it describes the purpose of the research. Chapter 2 (the Literature Review) will consider the literature relating to the meaning of risk and explore why people adopt different management procedures but also rely on standard processes in risk governance in different cultural contexts. Also, it will describe how socio-technology influences the governance of risk – whether it is possible to build a standardisation model for risk governance or not. Thus it may be more possible to discriminate between risk governance, as a legitimate form of management and surveillance, which raises deeper questions about accountability.

In Chapter 3 (Methodology), the main objective will be to describe the research approach, the methodology and the chosen framework for analyses. It will provide a discussion of the methods used to secure data from the CSRC in Taiwan, and explain the design for my fieldwork involving the interviews with managers who operate the campus security report system, and explains the quantitative and qualitative methods used in this thesis. Then, in order to distinguish and contrast the different opinions existing within the local organizational culture, both the survey results will be examined and integrated using a triangulation method.

Chapter 4 (Case Study I) illustrates the functioning of the Campus Security Report System, and explores the background behind the design and establishment of the system in Taiwan. Also, the thesis will describe how the system works and what the regulation and functional features the system has. For the purpose of finding the possible trend of risks from the historical data, this chapter explores the CSRS, and analyses the database, from 2004 to 2008, recorded in the governance system in Taiwan.

In Chapter 5 (the second stage of my case study) I will consider the operator's personal attitude in operating the CSRS. The research tries to discover answers to the three questions below. Did the CSRS provide a good communication channel between high schools and the Ministry of Education in reporting campus emergency events? Is there any impact on managers in risk governance at school caused by the organizational culture? What kind of attitude do people learn from managers who have operated the CSRS when facing risks in a socio-technical society?

In Chapter 6 (the third part of my case study) the goal is to collect the more specific opinion of operators in managing the CSRS. The data collection will rely on face to face interviews. I tried to explore more specific opinions drawn from different groups of people including operators of the CSRS. The research design in this case focuses on three issues. How does the governmental agency record data of campus security events to monitor potential risk that may happen in the future? What is the main relationship between organisational culture and risk governance in campus security events? Are there any significant differences in using or operating the technological system of risk governance between local operators and high level managers?

The final Chapter (Discussion and Conclusion) will summarize the findings and hopefully can contribute these findings to the social science field. I develop there the modeling of risk management according to the results of my survey which integrated the process of risk management, culture theory and the process of SCOT within what I argue are four possible stages of risks within risk society. The thesis will consider the implications of the findings for the risk governance of individuals, organizations, societies and government levels, and make some recommendations for the implementation of socio-technologies in enabling risk governance. This chapter will also draw on the results to develop an overall model for risk governance which though derived from the Taiwanese case, should have wider utility. This chapter will finish with suggestions for further research for those who are interested in this issue.

Chapter 2: Literature review

2.1 Introduction

The phenomenon of risk has been associated with the evolution of culture and society from the past to the present as well as the future since risk is always about the possibility of something (unwanted) happening. The Oxford Advanced Learner's dictionary defines risk as "the possibility of something bad happening at some time in the future, or a situation that could be dangerous or have a bad result" (Wehmeier et al 2005: 1313). From this point of view, risk is said to relate to a potential danger within a specific social context.

However, what are risks? Is there a stable meaning of risk applicable to every culture or society, and if not, how may this vary? This chapter explores the perception of risk in regard to some key factors: its meaning, scope, standard, and evaluation, and the theoretical approaches towards risk and its governance in socio-technical society: in regard to the latter, I also discuss the tension between the governance of risk and processes of surveillance.

2.2 The meaning of risk

Each organisation or society may develop some utility functions or unique cultures to transfer some empirical or theoretical knowledge for later generations. Some of such experiential inheritances may be recorded as language or word. Others are likely to evolve as customer or lifestyle existing in people's daily life. The following section explores two key aspects of risk: its meaning and how it has evolved over time.

2.2.1 The perception of risk

Words are parts of civilization. Risk in Chinese is called '危機' (wei ji), which combines two meanings : 危險 (wei xian), which means danger, and 機會 (ji hui), which means opportunity. According to this definition, it can be inferred that risk is something which may actually cause danger or harm as well as something that creates the conditions for a risk-laden event at the same time. However, what is uncertain is whether the possibility of risk follows danger or danger comes from opportunity. What about the meaning of risk in Western society? What is the evolution of the meaning of

risk? Here I examine the variations of the meaning of risk with regard to three elements: historical background, social activity and social science itself.

Marjolein (2000: 147) indicates that the concept of risk may be retraced to the thirteenth century. 'Risk' was derived from the Greek notion '*rhiza*' which means 'root' or 'cliff'; then Italian speech used the word '*rischiare*' with the same meaning, which relates to 'danger' as well. We can say that risk was originally used to describe a scenario associated with standing on the edge of a cliff, which thereby symbolized danger, what someone feels as danger. It indicates those kinds of situation which may cause harm for humans in dangerous surroundings. Therefore, in this sense risk is seen as a materially and physically dangerous situation that people can sense or feel.

According to the Oxford English Dictionary, the word of 'risk' was originally written as '*risco'* in Italian and '*rischio'* which is related to the meaning of 'uncertain' in 1661 (James et al: 1991: 987). In addition, Luhmann (1993: 9) explains that '*riscum*' may come from the renaissance Latin, which appeared in German in the mid sixteenth century, and then to English in the second half of the seventeenth century.

Luhmann (ibid) points out that in medieval documents the idea of risk was related to the fields of navigation and trade in the Middle Ages. Risk could also be found used in many societal contexts at the end of the seventeenth century (Murray 1933; Simpson & Weiner 1989; Zinn 2008: 7). Subsequently, risk changed its meaning to become a measure or calculation standard for insurance purposes associated with trade or navigation. Risk was specific to the potential for hazards to occur. It was a measurement for calculating the hazards for business, with which traders could then determine and negotiate an insurance fee, and in this way a new insurance profession and industry based on risk-calculation began. For example, a trader might need to calculate the uncertain (damage from hurricane/ attack from pirate) or invisible (run a reef/ scurvy cause crew ill) risks to determine (and perhaps increase) the insurance fee for shipping goods from continental countries to or from China. In this way risk has been redefined to include not merely real dangers but also the technical calculation of potential dangers.

When both uncertain and invisible subjective perceptions have been integrated to measure a level of commercial risk, it then becomes different from a simple concern with material or physical phenomena and is modified to relate to a potential and uncertain event. Thus, a more abstract sense of the word '*Risiko*' had become a part of

German in the nineteenth century (Grimm & Grimm 1854; Zinn 2008: 7) going beyond merely its application to commercial activities, risk became more widely used in culture, such as in people's customary language. As can be seen, in most of the English-language literature the explanations of the words, risk, hazard and danger, are similar and usually regarded almost synonymously (Renn 1985; Luhmann 2005: 22).

Furthermore, Hillson and Murray-Webster (2007) highlight the fact that risk has not only become a prevalent term in everyday vocabulary but also been used in the social science field to analyze both personal and wider collective circumstances in modern society, such as pensions, insurance, and investments in regard to health. For example, most health insurance companies take customers' health examination reports as one of the markers for deciding their insurance fee. Here risk measurement for an individual's health includes personal age and prior periods of medical illness, here moving from the concern of risk from commercial activities to those associated with individual risks and benefits.

Moreover, the concept of risk may be extended to business and consumer behaviour, such as, corporate governance, strategy or wider activity in the business community. In modern society, risk is then not only used for assessing the insurance of trade but also extended to the measurement of investment, the evaluation of the environment or the relation between employer and employee. It may also inform the licensing of new products coming to market.

More widely, it may be applied to a society and its livelihood — its economic performance, matters of social security, and environmental protection issues and food safety. There are new types of risk in the twentieth century, which people did not anticipate before. Some typical examples include global warming caused by the emission of carbon dioxide from human activity, or the Chernobyl nuclear reactor disaster, in 1986.

However, Beck (1992: 21) claims that we are living in the 'risk society' now; that is to say, nowadays everyone is living in a society that appears riddled with risks of one form or another. He argues that risk may be created when people try to develop new technologies to solve existing problems, because new inventions may be accompanied by new risks for societies. Risk resulting from new inventions increases the important of the management of risk and measures of control and security. For the needs of security,

for example, CCTVs are everywhere in our surroundings, which means people are monitored by the police or other agencies though this creates new risks inasmuch as some people are deemed to be potentially 'high-risk' based on specific security algorithms (Graham, 2010). In addition, finger prints are required when people enter particular nations, which put people under the surveillance of the immigration agency. Are these legitimate forms of governance or intrusive forms of surveillance, protections or infringements? This question is taken up later on.

In short, tracking the historical background of the word risk, one can find that it has changed from its original meaning of a real danger to a potential or possible danger in terms of commercial relationships, daily life, business relationships, diverse social activities and matters of individual and collective security within and between countries. Inevitably, such changes have made risk a prime area of interest for the social sciences.

2.2.2 The concept of risk

The historical account above shows risk move from real dangers to uncertainties and so to the emergence of new forms of regulation in culture (Luhmann 1993; Zinn 2008: 9). Such social activities likely have removed the concepts of risk from influence the safety at individual level to assess the commercial activities at social level. From the eighteenth century onwards the concept of risk had been embraced by a form of scientism, illustrated by the growth of probability theory in mathematics (Lupton 1999: 6).

Douglas (1992: 46) indicates that "as risk enters as a concept in political debate it becomes a menacing thing, like a flood, an earthquake, or a thrown brick". She also explains that risk is not a thing; it may be like an imagination or thinking coming from the human mind. This is the same as the examination of risk by Lupton (1999: 11), who also argues risk is not only a natural production, but also a highly artificial contrivance associated with social behaviour in modern society, such as traffic accidents and terrorism.

Meanwhile, if comparing the above concepts of risk, we can find an element in common — "the distinction between possible and chosen action, some philosophers call this contingency" (Renn 1992; Renn 2008: 1). From the philosophical point of view, risks may be the direct result of natural events or human activities, which tend to occur

in the potential of unpleasant circumstances. Despite its unpredictable characteristic, people tend to make causal connections between the events and their actions (ibid) in search for the possible ways to control risks.

In spite of the different types of risk events, Hillson and Murray-Webster (2007: 5) highlight two common characteristics of risk found in all societies, which are uncertainty and the consequences of the risk itself. Risks are uncertain because of their variable characteristics. In the past, traders forecast risks during maritime trade, but no one could predict the exact time and place because of unpredictable factors such as weather and human error. The second characteristic, the consequences of the risk itself, is noticed because it may have causal impacts on society. Consequently, if people ignore early warnings that are the precursor to risks, they may amplify their harm and impact on society. Some commentators call the latter 'social shocks' (Lawless 1977; Pidgeon, Kasperson and Slovic 2003: 23) that may cause concern for those who seek to manage risk.

However, some highly attenuated risk is a 'hidden hazard', such risks are normally unnoticed and unintended, but they do not disappear and often continue growing their effects until a disaster occurs (Kasperson and Kasperson 1991; Pidgeon, Kasperson and Slovic 2003: 23). According to Kasperson and Kasperson (1991), there are five hidden hazards: *Global elusive hazards, Ideological hazards, Marginal hazards, Amplification-driven hazards and Value-threatening hazards*.

Firstly, *Global elusive hazards,* which involve serious complex problems, such as regional interactions, slow accumulation, lengthy time lags and diffuse effects, have related to countries in conflict or political tension such as between Western and Eastern societies. Secondly, *Ideological hazards* are caused by values and assumptions that people have or are embedded in a societal web, such as religious beliefs, local customs and cultures. The religious war between Israel and Arabic countries, for example, seem to be caused by different religious beliefs. Moreover, the Second World War in Europe was caused by Nazism because Hitler persuaded Germany to join the war by means of ideology. Thirdly, *Marginal hazards* relate to risks people face at the 'edge' of cultures, societies, or economies. Such hazards especially happen in modern society because technology itself might be the source of hazard; The Space Shuttle Challenger disaster is a good example, where astronauts explore extra-terrestrial risks on our behalf. One of

the factors that caused the accident was created by a failure in the 'O-rings' on the booster rocket. Although a high degree of potential risk was accepted by the astronauts, such work circumstances are particularly dangerous if the hazard becomes out of control. Fourth, *Amplification-driven hazards* refer to the situation where people neglect the conventional type of risk assessment and environmental impact analysis, and as a result require societal intervention and create secondary harms to organizations or society. For instance, if a government prepares to build a nuclear power plant without proper safety evaluation and environmental assessment, it may cause major concern among members of the local society and even create a new hazard for government. Lastly, *Value-threatening hazards* may lead to the change of organizations/institutions, lifestyles and basic values. Such threats may influence the abilities of institutions to respond and adapt to the potential impact from hazards. The development of technologies outstrips the anticipation of both political and regulatory systems, which may not effectively respond to new hazards from technologies. For example, the development of biotechnology has created a new milestone for human health, but the policy makers may not have adequate enough knowledge for monitoring relevant innovation. As a result, the public may experience anxiety and confusion when they are treated with new medical innovation or offered GM crops based on such developments.

In addition to these hidden hazards, there are other general concepts about the meaning of risk offered by social scientists. As noted above, in terms of "risk society" Beck argues that risks could be defined as "the probabilities of physical harm due to a given technological or other process" (Beck 1992: 4). He demonstrates that "the concept of risk is directly bound to the concept of reflexive modernization". In modern society, risk analysis may be one of the systematic ways to treat hazards and insecurities; in contrast to older dangers, the consequence may relate to the results of modernity itself and the accompanying globalization of doubt (ibid: 21). However, Douglas, from a more cultural theory point of view, argues that in the past 'risk in itself was neutral; it took account of the probability of losses and gains", here a concept of risk originally linked to the context of gambling (Douglas 1992: 23). And Lupton argues risk is only used to refer to negative or undesirable outcomes instead of positive ones and also relates to threat, hazard, danger or harm in people's everyday language (Lupton 1999: 8). Integrating the views above, it can be argued that the concept of risk may be regarded as a systematic way to describe the potential physical harm, or to explain the threat to property and person within a specific cultural context, and the associated negative

outcomes of events, outcomes that are unacceptable to a society.

Lupton and Tulloch (2003: 37) develop their concept of risk through the diverse response they received in their empirical studies. Many participants think risk is negative, frightening and involves taking a step into the unknown. Therefore, most people will associate the concept of risk with potential danger and an unknown situation which may cause harm for their bodies and 'spirits', even in modern society. The concept of risk has permeated through daily life in modern Western societies. There is considerable research and discussion in this field (ibid: 1); for instance, the research in the field of science, medicine, law, the social sciences and economics may involve the exploration of the natural risk.

Literally speaking, risks refer to those uncertain factors that have not happened yet. If they become real, they may create a catastrophe, such as the September 11 attack. In practice, risks have already moved from the abstract possibility to the anticipation of further attacks, economic decline or worldwide war (Loon 2002: 2). Zinn argues that even though control over the occurrence of events is difficult, it is likely that people can make some provisions for the aftermath of these events (Zinn 2008: 4). By doing this, the future can be modified or at least can be subject to ongoing monitoring through human agency.

Renn (2008) suggests that there are five characteristics relating to the role and meaning of risk within society. Firstly, most governments or private institutions should understand they may face risks at any moment. Secondly, risk plays an important role in most contemporary theories of modern and post-modern societies. Third, risk is not just a phenomenon limited to a specific field of science, but has to be understood as an interdisciplinary subject. Moreover, risk is not only an important academic subject but also influences human daily life. Finally, risk is a concept developed by the change of life experience or environment and professional science knowledge (Renn 2008: XIII). He argues that these diverse notions of risk have affected people's lives, from the twentieth century to the present.

Indeed, several discussions on the concept of risk have been discussed in the social science field. Some scholars argue that risk is not a thing; it is a kind of thinking coming from the human mind. Some suggest that risk is not only a natural output, but also is an artificial production which may be associated with some uncertainy. People are worried

about the consequence of risk itself, which may be the side effect created by risk. Others are concerned with "social shocks' which are caused by risk, and such shocks may hide some potential hazards for people or society. In short, risk is related to negative unknowns and potential dangers for society.

2.2.3 The evolution of risk as a social phenomenon

The above sections first discussed the origin of risk, which shows it originally was associated with business activity within maritime trade in the sixteenth to seventeenth century, and the formal concept of risk, which has been modified by the development of civilizations and technologies.

The concept of risk has its own evolution from pre-industrial to industrial and then to post-industrial society. Such an evolution is caused by the changes within societies themselves. Significant changes in social styles and culture make people think they are "living in new times", especially in term of economy and politics, from the early twentieth century to the World War II (Smart 1993: Lupton 1999: 10-11). Such changes may be at the international/national level such as the end of the Cold War or the breakdown of the socialism and communism. Others may relate to societal changes: for instance, the development of communication technology which overcomes the limitation of space and time, economic decline or growth, the modification of familial relationships and the feminist movement (ibid: 10).

A number of sociologists argue that risk may relate to the constant flux, cultural fission and the breakdown of traditions (Giddens 1990; Massumi 1993; Lash and Urry 1994; Featherstone 1995; Lupton 1999: 11). They argue that risk may be not only be created by government strategy at a national level, such as the construction of nuclear weapons or power plants, but also influenced by national political changes, such as the disintegration of the Soviet Union and the East and West Germany merged. Such national evolutions have significantly influenced the meaning of risk today

2.2.3.1 Risk in the pre-industrial society

In pre-industrial societies risks were mainly caused by natural disasters or diseases such as flood and plague. People at that time, focused on their capacity to tame powerful natural resources for economic purposes and how to reduce the concomitant risks of potential side effects to human health and the natural environment (Habermas 1991;

Leiss 1996; Jager et al 2001; Renn 2008: 205). Uncertainty was a significant symbolic measure of risk. People might find such disasters unpredictable so they were considered as punishment from gods or demons (Beck 1992; Zinn 2008: 23). Therefore, religious ceremony might be one of the possible ways of reducing risks for the public as well as the powerful in pre-industrial society.

However, when marine business played a key role in western society, a more codified and less superstitious-based risk analysis created a secure indemnification for trade activities on the ocean. Many unpredictable risks had accompanied trade activities in society. Consequently, a more modernist meaning of risk began to emerge to include the evaluation of business, and risk itself evolved from being an invisible threat to more visible financial affairs, this especially so in the period that industrial society emerged, as I now discuss.

2.2.3.2 Risk in the industrial society

In the past, risks were kinds of uncertain phenomena influenced by nature. However, social changes created new types of risk to mankind and society. Zinn (2008: 23) points out that "the new risks are understood as man-made side-effects of modernization, even though unexpected or ignored". After the industrial revolution, risks became more tangible, not least through potentially hazardous machines being deployed in factories, which in turn prompted various governments to introduce legislation and social reform to control such risks. However, it is more difficult to calculate the scales and influences of risk because they are more significant than those in the past. Although the development of science and technology might minimize the impact of risks, they still could not be entirely removed.

During the 1960s expert discourses on risk proliferated as did new institutions and regulatory agencies dealing with the phenomena, conceptualised in terms of probability statistics and often managed through the use of computer technologies. Commentaries have suggested that people pay more attention to the incorporation of the causes, effects and value of risk (Short 1984; Douglas 1985; Skolbekken 1995; Lupton 1999: 10). Such causes are more complicated than those in the past and appear therefore more difficult to solve, but therefore in more need of being codified.

People often rely on scientific measures, calculation and control to identify the risks

which they may confront in nature or around them (ibid: 18). However, some psychometric researchers argue that while real risks may actually exist they are just interpreted as perceptions. Others argue that some risks can be defined and categorised. Some may combine both conceptions of risk in their work interchangeably, which can lead to considerable confusion (Bradbury 1989; Lupton 1999: 22). Moreover, the discussion and interpretation of risks may be even more complex, inasmuch as risks reflect powerful regional and cultural differences,

Risks today are also viewed as caused by humans, and thus responsibility and blame is generally leveled at everyone in the society for the production of risks (Beck 1990; Tulloch and Lupton 2003: 3). New types of risk might be created by modernization which includes scientific development and human behavior/activities such as the development of nuclear power and weapons, from the legacies of the colonial period and the confrontation between state communist and western democratic states.

This has led to the argument that society has become more risky in the more recent period because of the endlessness of unpredictable and uncertain risks especially at a global level. Beck (1999: 2) argues that "the risk society is understood as a world risk society, increasingly influenced by the management of transnational risks and processes of societal globalization". The more benefits from the development of technologies that people and society obtain, the more certain and uncertain risks people and the society may have to accept in such a 'world risk society'.

2.2.3.3 Risk in the post-industrial society

Social development, cultural changes and technological invention have challenged the ways in which social order is secured, while society itself has become increasingly individualistic. For example, globalization brings wider and more various cultures for local society and the invention of the internet has changed the concept of space and communication across it. Beck argues that "new and future social developments cannot be conceptualized properly with the categories of past and present society" (Beck 1998, 2000; Beck & Beck-Gernsheim 2002; Zinn 2008: 18). Therefore, in post-industrial society such elements may create a variety of new types of risks for individuals, societies, environments or countries.

Risks may be controlled by new technological measures; however, most potential risks

are still uncertain and unpredictable, appearing anytime and anywhere. Therefore, the developments of new technologies tend to intervene in nature and affect many aspects of modern social life. Controlling a variety of irregular or unpredictable factors, especially in terms of ecological and natural protection, is an important endeavour in post-industrial society (Giddens 1991: 135). However, sometimes the new technologies introduced into social contexts may be thwarted by both unintended effects and regional institutional structures, if their boundaries are more or less permeable to socio-technical innovation (Webster 2007: 144).

In post-industrial society, social science is not only concerned with the new risks from technical production and their impact on society but also focuses on societal self-transformation through the processes of individualization or institutionalized individualism (Beck & Beck-Gernsheim 2002; Zinn 2002; Zinn 2008: 21). Sociologists, such as Ulrich Beck and Anthony Giddens, have presented theoretical accounts of the 'risk society' in which risk itself has become a force of social change. Both of them agree that new types of risk challenge the order of post-industrial society, and they also emphasise that the socio-political order generates new social problems, especially those caused by the development of technologies that create ecological problems (Lupton 1999; Loon: 2002: 2). They believe that risks in the post-industrial society not only cause threats for single societies but also pervade global society.

In sum, the evolution of risks has been influenced by the various developments of technologies and the changes of society. In the past, the hazards could be ascribed to natural disaster or an undersupply of hygienic technology. Today they may be created by various forms of industrial production and products. The essence of risks have evolved from the more limited concept of danger in the Middle Ages through to the modern causes which are influenced by the growth of global society and the development of high technologies as both visible and invisible threats (Beck 1992: 21). The world risk society may adequately describe the situation in modern society. More unpredictable threats will be influenced by the side production of technologies and be created by some invisible risks which may bring major disasters for modern society. The next section discusses the boundary and harm of risks in the world risk society.

2.3 The scope of risk

The above exploration of risk discussed the historical background with social

phenomena and the evolution of risk associated with a change in social culture. This section explores debates over how risk is to be assessed. It seems that the pervasion of new types of risks in the socio-technical society is unavoidable. Therefore, both the scale and potential impact of technological developments and the increased awareness to people's health and to environmental quality hazards have risen to the top of the political agenda as key concerns in Western industrial nations (Dunlop 1991; Dunlap et al 1992, 1993; Schultz 2001; Eurobarometer 2006; Renn 2008: 205).

However, the scale and significance of the relationship between health, technology and societal risk is neither the same across different societies, nor stable within any one society (Webster 2007: 49). Consequently, the more sophisticated and diverse the range of technologies there are to manage risk, the more complicated the measurement of the scope of risk may become.

2.3.1 The boundary of risk

The evolution of civilization was built on the multiple activities of societies. Regarded as the potential threats caused by natural disasters or disease around domestic life in the pre-industrial society, the boundary of risks has been limited by the characteristic of geography. In modern society, the scopes of risks have been gradually extended by the development in industry and innovation in technology, from visible borders to invisible frontiers. Indeed, the advancement of culture has made a barrier between the present and the past. People believe that the development of science may empower human abilities to control and to predicate most risks. The boundary of risks has evolved into a more complicated one because it tends to involve natural events, economic, social and technological development, and policy-driven actions, and has been accompanied by a move in significance from the domestic to the international level (Renn 2008: 5).

Despite the fact that all potential risks will affect society, if people ignore them their effects may be too late to manage (Zinn 2008: 25). In addition, notions of human superiority may create an illusion for people to think that there is nothing they can be learned from their own origins and from other cultures (Douglas and Wildavsky 1983: 33), which may increase the impact of invisible risks on people and society. Normally, the distribution of life chances through any society is unequal. Risks accepted by some people may be regarded as unwelcome by others. Some people tend to take greater risks or to accept a greater degree of danger. For example, the boundary of risk to a pilot in

the air show may be greater than that of the audiences (Douglas and Wildavsky 1982: 18), which shows that the boundaries of risk vary according to the attitudes people take when facing risks. However, individuals do not exist as isolated social atoms (Thompson, Ellis and Wildavsky 1990: 179); everyone is a part of the culture and society. When the boundaries of risk have been expanded by the development of technologies, it is highly likely that citizens are not able to isolate themselves from the events that happen in society.

The consequence of the development of science and industry may include a set of risks or hazards, creating events that society has never faced. New types of risks can no longer be limited in time and may affect future generations. Unlike those of the earlier society, nowadays everyone is affected by the risks in this the risk society (Douglas and Wildavsky 1983; Beck 1992: 2) as there is no specific boundary to world risk events such as nuclear, chemical, ecological, and genetic engineering risks (Zinn 2008: 23).

The measurement of the boundary of risk may also be influenced by gender. Discussing the individualization of risk from the characteristic of gender, Beck is aware that there is a gender difference in the perception of risks boundaries and the decisions made in face of risks (Beck 1992: 104-106). Indeed, the concepts of the risk boundary vary across different individual, social and scientific points of view. Economists tend to use a modernist conceptualization of rational action to tackle risk. Psychologists approach risks at an individual level. Sociologists tend to adopt a different position such as examining the background, social action, institutions and culture, rather than focusing on rational planning or individual emotional influences (Taylor-Gooby 2006: 8). Risks have become more and more difficult to calculate and to control because the globalization expends the boundaries of risk crossing nations and socioeconomic systems (Beck 1992; Tulloch & Lupton (2003: 2). Therefore, it is hard to define the boundary of risks by inducting the multiple causes of risk, which may be influenced by the characteristic of individuals such as gender or the ‘edge worker’ (risk takers), and the development of social change through globalization.

2.3.2 The harms of risk

Most social activities aim at improving living conditions and serving human needs and they may transform nature into a cultural form (Renn 2008: 5), and this process of transformation may bring potential risks to society as well. Therefore, some risks are

passively incurred by people's activities. In the pre-industrial society most risks were caused by direct hazards from nature and people had little choice but to accept the loss of their life or property. However, modern society seems to refuse the notion that risks are linked to fate or destiny (Lübbe 1993; Marjolein 2000: 156). As a result, risk issues have gained enormous importance and have become foregrounded phenomenon (Vlek 1996; Marjolein 2000: 156), because while potential risks may be huge, they might be controlled.

The possible harms from risk might be assessed or evaluated by their visible damage to property or physical injury in pre-industrial society; for the evaluation and assessment of the harm from risk it is possible to build statistical standards for the measurement of risks, because their spatial and temporal scope may be measureable in modern society. Lyng identifies some boundaries that define the edge of physical and psychological harm in various ways: the boundary between sanity and insanity, consciousness and unconsciousness, and the line separating life and death (Lyng 2005: 4). On the one hand, he thinks risk not only causes visible harm to the micro-system of society such as the physical injury or loss of property for citizens but also may create invisible scares and psychological trauma to the human mind. On the other hand, risks may cause damage to the macro-system of society such as a nation or continent, for example, through global warming, environmental pollution, nuclear waste pollution and new threats from terrorists that all create significant impact on a large scale. Paying attention to the enormous harm caused by nature or human action is a responsibility for government, so to protect citizens who cannot otherwise protect themselves (Douglas and Wildavsky 1982: 58). For instance, in order to protect the safety of the citizens, the government tries to diminish the potential risks from terrorists by keeping them under surveillance.

Zinn (2008: 34) highlights that the citizens who are liberated from socio-cultural structures "have to choose between social group affiliation, lifestyle, and identities with all the side-effects, and have to take the responsibility for themselves'. In other words, people living in modern society are also living in risk society. The more modern technologies people invents, the more potential harm the next generation will encounter. With the modernization of civilization, it is hard to prevent this process.

2.4 The standards of risk

In order to understand and analyze risks sociologists have developed various models

that examine risk as either acceptable or unacceptable.

2.4.1 Acceptable and unacceptable risks

As noted the perception of risks varies from person to person. The choice of the risks that people worry about depends on "Risk taking and risk aversion, shared confidence and shared fears, [that] are parts of the dialogue on how best to organize social relations" (Douglas and Wildavsky 1982: 8). Indeed, it is hard to classify risky phenomena in some standardized value because people live or work in different regions and organisations which may have different concern about risks (Morgan et al 2000: 52). So, although Beck argues that risks are objective phenomena which have prolifated out of control, their meaning is a reflection of mediation through social and cultural processes (Beck 1995; Lupton 1999: 5). Social science may try to identify why people ignore some potential dangers surrounding them and concentrate only on selected aspects of the risks the culture and society in which individual live.

Talking about acceptable and unacceptable risks reflects justified aversion with regard to the idea of irreversible damage, because the smallest probability of a disaster overwhelms all other considerations (Douglas and Wildavsky 1982: 21). Risk is not only broadly discussed in academic research or policy contexts, but pervades people's daily lives. Harris surveyed various groups of people, including the general public, corporate executives and federal regulators, about their attitudes toward facing risk and found that most of them thought that there were more risks in society today than in the past (Harris 1979; Douglas and Wildavsky 1983: 2). This view is also supported by Beck's argument that risks or hazards are created by man-made hybrids which are produced by risk societies (Beck 1999; Zinn 2008: 26), such as bovine spongiform encephalopathy (BSE). On one hand, society does not accept the potential risks which may cause threats to them. On the other hand, people may ignore the more complicated and more serious hazards which may be more predictable. Therefore, determining the standard between acceptable and unacceptable risks is highly problematic.

Often, policy for risk management is based on a standard of public justice, and the perception of risk is directed to the justice and fairness of risk that citizens can accept. Society will not accept the coercion strategies for imposition of risks from governmental institutions, if they ignore the commitment to some form of public accountability. However, if such schemes demonstrate such a public commitment, society will then

accept the explicitness and fairness of risk monitoring procedures, (Douglas 1985: 5). Diverse cultures and periods may create different risks because of the dynamics of changing social structures. Some risks are acceptable to some societies because of the benefits accompanying them, but are unacceptable to others due to possible property loss or threat to life. Both acceptable and unacceptable man-made risks exist at the same time in the world risk society. The boundary of what are acceptable and unacceptable risks remains a controversial issue.

According to Douglas (1985:10), whether citizens in a society accept risks depends on two factors — freedom and justice. For example, individuals make their own judgment about what kinds of risk they want to take. In organisations risk seeking members may encourage each other to take greater risks, even if they are of high uncertainty (Ibid, 1985: 75). So, the boundary between acceptable and unacceptable risks may be based on different places, interests and scope at the individual and wider level.

2.4.2 Standardisation and individualisation

Risk is understood as one of the complicated strategies to manage disciplinary power which achieves the goals of monitoring and managing both population and individuals (Lupton 1999: 4); however, if an individual has to determine the best way to solve risks, one of the effective ways may be a standardisation process which is established by government and seen as generally applicable. Gourvish (2003: 220) highlights that the understanding both the possibilities for and limitations of risk management through standardization is important as it may empower the government to cope with risk more efficiently.

Risk-taking is a contested issue between society and individual. Some researchers argue that risks are shared within cultures or communities rather than being the products of individual knowledge and perception (Douglas 1992; Tulloch and Lupton 2003: 6). Although they are cumulative and complex phenomena, each risk may have a rational aetiology and can be reasonably explained and acted upon. As risk becomes omnipresent in risk society, there are only three possible responses: denial, apathy and transformation (Loon 2002: 1). The individualisation of risk-taking not only involves various influences which may be caused by personal behaviour, work experience and economic factors, but also may be formed through the dynamics of family, childhood and gender. For example, Jackson and Scott (1999: 102) discuss ‘Risk anxiety and the

social construction of childhood', and point out that risk anxiety has material effects and that parental fears may limit children's lives and experience which will simply serve to increase their dependence on adults in the future. They find that what is terrifying for a city child may be trivial for a rural child and vice versa. Therefore, the context through which the individualisation of risk occurs may be key to determining what risks are acceptable and what are not..

Beck (1992: 128) argues that "individualization was understood as a sociological category, located in the tradition of research into biographies and life situation". Both peoples' behavior and beliefs were assumed to be the key factors to distinguish what happens to people and how they dealt with problems. He believes that the concept of the individual lies at the centre of the modern society and the essential component of both democracy and markets (Beck 1992; Loon 2002: 29). Indeed, the foundation of society is assembled by the multiple individual activities. Parts of the standards of risk in the society are also built on the interaction of individuals. However, making judgment about risk can never solely be based individualistic belief, for some form of social order to be maintained (Tulloch and Lupton 2003: 7). The standardisation of risk is a key part of this social ordering.

Social conditions and individual experiences have a great influence on the establishment of the social or individual standards of risks. The individual's expectation of risk may be affected by their assessment of its endurance and harm (Douglas and Wildavsky 1982: 86-87). The social standardisation of risks reflects the assessment of risk at a wider level, by those in positions of power – government, corporations, professional bodies etc. - and will require compromise because the limitations of risky standardisation need to be negotiated by different social groups in society.

2.5 The evaluation of risk

The standards of risk for individuals and society vary in terms of the scope, level and personal or social attitude to risks, depending on the acceptability of risk. Technology assessment may be one of the approaches to the evaluation of risk and contributes to various achievements such as risk analysis. This may improve people's understanding of their relationship with their social context and may enable the acceptable level of risk from a cultural viewpoint (Douglas and Wildavsky 1982: 81). However, the globalization of risk has influenced the calculation of risk at the local level, which has

made it more and more difficult to control risks, and new type of risks crossing natural and socioeconomic boundaries evidently exist in modern societies (Beck 1992; Tulloch and Lupton 2003: 2). Beck points out that the concern of new risks may create new political subjects which include different class members of occupational groups, generations, and civic action groups (Beck 1992: 62). As a result, the more interests that are concerned in the evaluation of risk, the greater there is a move towards its evaluation and control.

2.5.1 Predictable and unpredictable

Through analysing the components of risk, we may find it assembled by practices, techniques and rationalities which help humans or organisations to govern potential threats. From the perspective of sociology, risk is then an ongoing process that society experiences and seeks to control. It is a calculative rationality that guides the regulation and management of risk, and shapes government-citizen relations (Dean 1999: 132).

In modern society technologies not only support human life but also produce risks: the more novel technologies we introduce now, the more concerns about the potential threats we have to evaluate from the past to the future. And technologies (of risk management) themselves advance the statistical/technical ability to enable us to calculate the potential threats which accompany the development of technologies (Douglas and Wildavsky (1982: 29).

Early risk assessment was focused on identifying, measuring and evaluating the consequences from both natural and technological hazards. The science of risk calculation is concerned with estimations of the probability of the occurrence rate of risks and their likely effects (Tierney 1999; Taylor-Gooby and Zinn 2006: 206). Lupton (1999: 68-69) highlights the introduction of new technologies for determining 'normality' in people's daily lives, which forces people to make decisions with reference to risk statistics; for example, women in Australia over thirty-five are offered amniocentesis or Chorionic Villus Test CVS to check for chromosomal abnormalities in the foetus. Douglas and Wildavsky (1982: 50) argue that the finding of new dangers through advanced technologies has overtaken people's ability to discriminate between such dangers.

The prerequisite of predicting risk seems to presume the possibility of defining the

essence of risk itself and so to identify risk, assess its significance and determine appropriate responses (Hillson and Murray-Webster 2007: 5). The limitation of risk assessment and the management of risk uncertainty have been improved by the advanced quality of calculation and assessment from technologies – algorithms of risk management – which seeks to make uncertainty predictable (Taylor-Gooby and Zinn 2006: 57). Therefore, technology seems to be a kind of catalyst, not only affecting the new risks to society but also improving people's ability to predict the possibility of risks.

However, new types of risk may cause damage bigger than that in human's prediction or unpredictable due to people's limited knowledge. New large-scale risks may exceed the acceptability for the society and be difficult to control by a single institution or even a country. The hurricane Katrina in American, the tsunami in South Asia, the financial crisis or climate changes around the world are unpredictable risks influenced by various factors. If the potential risks never come to reality or the process of risk goes beyond people's prediction, it is hard to distinguish the boundary between predictable and unpredictable risks. Therefore, this has caused the evaluation of risk to be more complicated.

2.5.2 Certainty and uncertainty

To improve the standard or environment living standards or the wider environment and achieving meet human wants/needs, the social activities may transform nature into cultural environment goods and services, which is one of the factors that people creates the new risks (Turner et al 1990; Hillson and Murray-Webster 2007: 5). Risks are passively then indirectly made by the specific social activities. Science and technology cannot determine threats with regard to moral or cultural issues because it is society itself that makes the decision of what risk is (Douglas and Wildavsky 1982: 81). For example, the introduction of new medical technologies in the British health service has encountered ongoing problems that are both social and technical in nature. This is because people find it difficult to accept the uncertainties of risk associated with medical innovation (such as in fields such as genetics) (Webster 2007: 25-28).

Certainty and uncertainty of risks have different definitions, which may be influenced by region, race, religion, culture or moral values, even technology itself. This uncertainty has been enhanced by more and more complex threats (Beck 1986;

Marjolein 2000: 82), which are increased by the interaction of regional scale and the globalization of technological development. Marjolein (ibid: 83-85) concludes that there are two major varieties of uncertainty: 'objective and subjective uncertainty'. The objective one also relates to stochastic, primary, external, and random uncertainty which may be influenced by outside factors, while subjective uncertainty may have no standard form because it relates to personal knowledge or judgment.

Lupton (1999: 9) argues that "risk and uncertainty tend to be treated as conceptually the same thing". The discussion of risk in social science has contributed to a sense of studies, such as risk analysis, risk assessment, risk communication and risk management, all of which may improve measuring the ability to identify risks and monitor them. Beck suggests that uncertainty is non-probabilistic so that the government cannot expect to calculate for the future; however, this is a feature of the modernization risks (Beck 1992; Zinn 2008: 72). Luhmann (2005: 41) suggests that when looking back into the past we at least know what has happened, even if causal relationships remain unclear. Although we may lack information of potential risks when looking forward into the future, from a practical point of view, social actors will try to control uncertainty. At the same time, defining what these uncertainties and risks are relates to power. Tierney (1999: 236) argues that

> "Political and economic power determine the ability to impose risks on other, shape public discourse about risks, sponsor and conduct research that presents risks in particular ways, and lobby for particular positions on the acceptability of risk".

At the same time, the ability to 'impose' definitions of risks is influenced by cultural factors and the particular context of risk management in everyday life, as will be seen later in the thesis when I discuss my case study in Taiwan.

2.6 The theoretical approach to risk

Nowadays, society is likely to be increasingly dependent on technology to manage risk. In order to improve and protect human life, scientists rely on technology to measure, evaluate and analyze the data collected from nature or society, such as weather forecasting, the warning system for a tsunami, global temperature monitoring, and the investigation and assessment of crime. Even though the functions of technology today

are more advanced than those at any previous period of human history, paradoxically no one can assure whether danger is predictable or if a risk is certain in such a high-technology society.

Renn (2008: 2) integrates three elements in defining risk. The first one is the outcomes of risk which may have an impact on people's values. Each risk may cause different influences on people or their environments. Although some aspects of the impact may be accepted by some people, they still influence their behaviour and attitude, especially those who are directly involved. The second element is the uncertainty of the possibility of occurrence. Although there are various types of risk, we can still find some similarities between them. Little predictability may be the most obvious one. The last one is the combination of both elements above.

Indeed, risk is uncertain at both an individual and societal level. The development and construction of risk theory has been extensively discussed in the social science field since the end of the nineteenth century. My thesis focuses here on the discussion of three main social theories below: 'cultural theory' by Mary Douglas (1966, 1978, 1986, 1992) and Aaron Wildavsky (1982), 'risk society' by Ulrich Beck (1986) and 'risk governance' by Michel Foucault (1991).

2.6.1 Risk governance

As noted before, risks may be created or produced by the uncertainty of natural phenomena, the development and innovation of technologies, and human action itself. The meaning of risk and the background of the evolution of risk have been described in the section above. Checking the meaning of management individually, we may find important causality between risk and management. The standard of risks also may be influenced by individual personality or values, the characteristics of culture or some unpredictable changes of globalisation in the contemporary society. Therefore, risk management/governance may raise a deeply concerned issue about who should take responsibility for risk in the public or political field. Foucault (1991: 87) points out that the problem of government referred to the personal characteristic in the sixteenth century Stoic revival, and also related to the governance of the souls and lives in the entire theme of Catholic and protestant pastoral doctrine. Consequently, government was defined as a right manner of distributing things, which may ensure the greatest possible quantity of wealth to produce/provide people with sufficient means of

subsistence (ibid: 95).

In his essay "Governmentality", 1978, Foucault indicates that the initial ideas of governmentality emerged in the seventeenth-century in Europe. The term relates to the notion of self-governing, and that governance acts to ensure a self-regulating order of things. There are three fundamental types of government which relate to particular disciplines among morality, economy and politics. Firstly, the art of self-government concerns morality and focuses on individual desires set against moral norms. Second, the art of the governance of property addresses that a person has to not only manage oneself but also govern his/her property such as goods or patrimony. Finally, the science of ruling the country which concerns politics may involve the management of demography, economy and state policies (Foucault 1978: 206).

Moreover, research on governance has widely featured in political science, policy studies, sociology of environment and technology and international relations literature, as well as risk research more generally in the last decade (Ortwin 2008: 64). Also, governance has been described as the kinds of structures and processes in decision making which involve governmental and nongovernmental actions, on a national scale (Nye and Donahue 2000; Ortwin 2008: 64) as well as at the global level among governmental institutions, economic forces and civil society actors such as NGOs or NPOs. For example, in Australia, the roles of the Department of Contract and Management Services (CAMS) provide services for government business designed to improve the governmental agencies' ability to manage contracts and procurement risks (Baccariani & Archer 2001: 139). In addition, an NGO report on 'the global road safety crisis' discussed the main risk factors and solutions for different regions, such as Asia, Africa, Latin American, Europe and Central Asia as well as the Middle East and North Africa from a global viewpoint (Global Road Safety Partnership, 2008); and the 'world report on child injury prevention' published by the World Health Organization (WHO) discussed the main factors which cause child injuries from road traffic (Margie et al 2008). Both of the latter present the question of risk management among different regions from a global viewpoint.

Renn (2008: 173) highlights that risk management consists of both risk assessment and concern assessment, which may relate to risk perception studies, economic impact assessments and the scientific characterization of social response to the risk source,

particularly from combining all relevant information for risk appraisal. The International Risk Government Council defines risk governance as

> "risk governance deficits are deficiencies or failures in the identification, assessment, management or communication of risks……it is important to understand how deficits arise, what their consequences are……or their potential negative impact can be minimized……the causes of failure in risk governance processes……They may occur in the past, occur now and will probably recur in the future" (IRGC 2009: 9).

Accurate knowledge and understanding are essential for effective risk governance which helps people reduce the complexity, uncertainty and potential of risks coming from physical, social and economic areas. IRGC concludes two types of knowledge for risk governance: *scientific knowledge and knowledge of risk perceptions.* The former has association with the physical properties of a risk such as the probability of the risk occurring, the potential impacts and the consequences; the latter includes their underlying determinants and consequences such as the interests and values of risk with people, recent risk in the mass media and the consequences of conflict among social, economic and political areas between experts', decision-makers' and lay-peoples' perceptions of risk (ibid: 11).

Effective uncertainty management requires effective understanding of uncertainty, which may rely on an effective process for sorting out the uncertain problems. Making this process efficient is also a direct concern to the governing and the governed (Chapman and Ward 2002: ix). However, in any given decision situation both threats and opportunities are usually involved, and both should be managed. Sometimes both elements may be treated separately, but they are seldom independent (ibid: 1). Chapman and Ward argue that it is rarely advisable to concentrate on reducing risk without considering associated opportunities because the more resources we spend on risk management, the less effort we make for the pursuit of opportunities (ibid: 2). In other words, the task of risk management is not only to prevent the potential threats but also to obtain the benefits on the other side of the balance. Thus, it is likely to improve the effective management ability in understanding the nature and significance of this uncertainty.

Renn (2008: 173) concludes with three potential outcomes of managing risks. Firstly, in

the situation which is unacceptable for societies or organizations, the risk source needs to be abandoned or replaced and the managing strategies need to be designed to reduce and expose the vulnerabilities. Secondly, when the situation is acceptable and can be managed or governed by the organisations or societies, risks may be reduced or handled by some limited and reasonable resource, by means of facility or financial investments. Finally, in the acceptable situation, which is a negligible risk, the investment in reducing harm is unnecessary. Both organisations and societies may ignore such risks. Moreover, Ortwin (2008: 63) points out that risk management may be adjusted by manager's strategies, which may create some opportunities or reduce potential threats for most populations. Sometimes managers may suggest other substitute or alternative procedures to replace the routine tasks to solve the unpredictable risks. He believes that

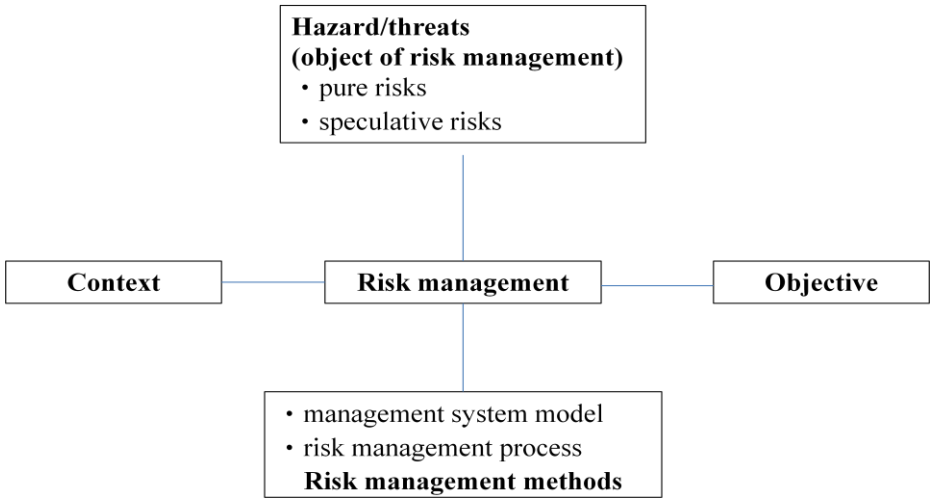
> "risk treatment refers to the creation and evaluation of options for initiating or changing human activities or (natural and artificial) structures with the objective being to increase the net benefit to human society and prevent harm to humans and what they value" (ibid).

Indeed, societies may select what is worth considering and what can be ignored. For example, risk managers tend to search for the most efficient strategy to deal with risks in industrial areas; risk regulators often use pre-screening activities to allocate risks to different agencies or to pre-define procedures in public issues (Thompson et al. 1990, Douglas 1990, Beck 1994; Ortwin 2008: 66-67). The operational process of risk governance covers various stages from preventing and warning the possible risks to assess, manage and communicate risks. Both underestimation and over-estimation need to be avoided in risk assessment because they may cause under-reaction or over-reaction in risk management. However, risk governance is not only influenced by some human factors, such as an individual's values, personal interests and beliefs, intellectual capabilities, the prevailing regulations or incentives but also may through the irrational or ill-informed behaviour (IRGC 2009: 9-10).

Risk governance cannot, therefore, be isolated or separated from the standpoint or position of organisations, societies and cultures within the socio-technological society (Renn 2008: 353). The knowledge of risk management is not only concerned with everyday life but also relies on scientific knowledge to calculate the uncertainty and to achieve the possible precaution (Zinn; Taylor-Gooby 2006: 56). Technologies improve

the quality of perceiving and managing the risks by narrowing down the scope of uncertainty (ibid: 57). Taylor-Gooby (2006: 210) highlights an important aspect in technical society which is to understand the limitations of risk management, involving analysis of the helpful situations, the various impacts, possible management tools and to undertake comparative work across different types of organizations and domains in the private and public sectors. For example, Florig et al have developed a five-step risk ranking method which involved decision theory, risk analysis and the psychology of risk communication to categorise risks within schools. They argued that risk ranking can be linked to risk management interventions and provide a way to translate analysis into policy decisions (Florig et al 2001: 914-915). Waring and Glendon (1998: 4-5) presenting four key dimensions envisioned in the scope of risk management (see Figure 2.1).

Figure 2.1 Four dimensions of risk management



Source: *Managing Risk* (Warning and Glendon 1998:5)

Consequently, a variety of management strategies has been produced to reduce the possible mistakes from man-made failures, the potential threats from nature and the interactional risks from both of these. For example, the International Organization for Standarization has provided principles and generic guidelines (ISO-31000) on risk management in commercial and organisational territories (Purdy 2010: 881-886) such as the Standard Operating Procedure (S.O.P) has developed a standard procedure to reduce mistakes in the engineering field. Those standard procedures are built on the basis of

accumulated experience and knowledge from daily life. Furthermore, Morgan et al (2000: 54) highlight that four factors should be considered when reflecting risk management objects, such factors include "an ideal risk-categorization scheme [that] should be logically consistent, compatible with administrative systems, equitable, and compatible with human cognitive limitations".

In practice, the development of socio-technical systems and the innovation of new technologies have achieved the new territories in risk management; such achievement supports some safety warning systems and security protection functions for human. In theory, risk management is a kind of controlling power, which may affect the freedom of individuals in society. Initially, the institution of power was developed from the monarchy in the Middle Ages. The principle of regulations and laws were established and proclaimed by the monarch who had to establish a peaceful environment for rulers to control and protect the power (Foucault 1976: 86-87). In order to lead a safer life, citizens might accept some sacrifice on privacy and endure some limitations on freedom. Therefore, in technical societies citizens are monitored and controlled by the government. Some scholars argue that people nowadays live in a 'surveillance society' (Staldar 2002: 120; Lyon 2002: 26). Consequently, the controversial issue of surveillance and governance has been debated in recent times.

Dandeker (1990: 38) highlights that surveillance is a kind of rule established in administrative bases within organisations or societies. It shows that the organisations control available power resources to monitor their administrative staff or citizens and those in power have the right to view private information. From a sociological point of view, a surveillance system or culture is a kind of power which provides an alternative eye for government to monitor and scrutinize the information of a population in a socio-technical society. The problem is that surveillance systems have made people attempt to strengthen individual privacy which may work against wider social relationships (Lyon 2002: 26). Lyon argues, however, that the question of heightened surveillance is not merely a problem for personal justice or freedom, it may mean that certain groups or individuals are being discriminated against by society (ibid: 17). Although lots of surveillance systems have been extensively applied to the social security protection strategies such as CCTV on the streets or x-ray for checking luggage at the airport, there are many debates on the issues of governmental power or individual privacy, and governance right or surveillance. Such strategies are often applied by the

government to manage poor and vulnerable minorities (Kemshall 2002; Taylor-Gooby 2006: 282).

As Foucault argues, risk management is a form of power that has affected people's freedom; this situation has remained similar from the Middle ages to the modern society. At the same time, different societies and cultures have different views on risk. The acceptability or tolerability of risks may be influenced by people's knowledge, experience, organizational culture or social custom. The following section, from a cultural theory point of view, explores various concepts of risk in different cultures.

2.6.2 Cultural theory

What is culture? From the sociological point of view, Williams argues that culture has four meanings.

> It came to mean, first, 'a general state or habit of the mind', having close relations with the idea of human perfection. Second, it came to mean 'the general state of intellectual development, in a society as a whole'. Third, it came to mean 'the general body of the art'. Fourth, it came to mean 'a whole way of life, material, intellectual and spiritual' (Williams 1958: xvi).

Storey (1994: 32-33) points out that there are three general categories in the definition of culture. Firstly, ideally, culture may be defined as an expression or mode of human perfection, in terms of certain absolute or universal values which may in fact reflect powerful religious or political ideologies. The second is a 'documentary' approach, in which culture is the collection of intellectual and imaginative work, through which human experiences are variously recorded. Thirdly, in terms of a 'social style', culture is described as a particular way of life, which expresses certain meanings and values in a particular culture.

Therefore, the analysis of culture is essentially one of discovery and description, which may provide permanent reference to the universal human condition. It is also an activity of revealing, which discovers local experience and convention through exploring the detail of social activity and language. Normally, the analysis may contain historical criticism. It is a highly intellectual and imaginative work which is not only related to particular broad traditions and societies, but also helps us to understand specific subcultures, such as the characteristics of an organisation, the structure of the family

and other social institutions. This may provide us with a chance to distinguish the pattern and detail of the culture, including any possible threats or risks that it has to confront. Such risks are then risks to the culture (or subculture) itself.

The sociological discussion of risk provides a rich understanding of the ways in which culture and the perception of risk are linked. Douglas (1966: XIX) demonstrates that risk perception depends on shared culture, rather than individual psychology. She argues that risk is like a taboo; it may be a dilemmatic issue in both moral and political domains in society. The ways people treat risks might vary from culture to culture, because some risks accepted by one culture may be regarded as terrifying hazards by another. There is an interesting case that rats may be regarded with revulsion in the West and associated with potential disease by most people, but they are regarded as sacred in the Karni Mata temple in India. Despite its importance, many areas of social science outside of sociology and social anthropology have neglected to examine the role or meaning of risk. Douglas points out that

> Many economists leave it severely alone……most Philosophers ignored it; ……Marxists treat it obliquely as ideology……Psychologists avoid it, and only concentrated on child subjects. Historians bend it any way they like (Douglas 1978: 1).

Douglas thinks that some taboos may reinforce redistributive policies and others may prevent governments or individuals from accumulating power (1966: XX). The perception of risk depends on a shared culture in society; some cognitive divergence of risk from those taboos may impact on people with in different cultures. Approaching risk through cultural theory, we may find risk a menacing thing, such as a flood or pollution. In fact, it is not a real thing but a way of thinking (Douglas 1992: 46), and it is a highly artificial contrivance based on human "value attitudes" (Douglas 1978: 1). In other words, people's values may be influenced by a variety of factors, such as individual experience, family tradition, community ideology and even government policy; those elements are parts of the culture.

Examining the strength and direction of social concerns about risk with a cultural approach, we can perceive that public concern may identify potential or real dangers in society. Risks also can be discovered through a cultural approach to how a community consensus relates some natural dangers to what are in effect seen as moral defects. A

good example is that the water problem which was a persistent problem in the fourteenth century became a public issue only when it was related to the Jews (Douglas and Wlidavsky 1982: 7). When community connects the natural dangers with the moral issues a cultural approach may be the best viewpoint to explore the social definition of risk.

Douglas (1992: 36) suggests that cultural analysis may help us with two things: to categorize what kinds of culture are most likely to be at risk and to count who will be the culprit exposing others to risk. She also points out that the weak carry the blame for what happens to them in an individualist culture; whereas the leader may avoid the accusation in a hierarchical culture (ibid: 36). Therefore, she argues that the debate over risk is shaped by social institutions and patterns of authority and power that they support.

Consequently, Douglas and Wildavsky (1982: 5) believe that "risk should be seen as a joint product of knowledge about the future and consent about the most desired prospects". They integrate two factors – knowledge and consent – and build four kinds of problems associated with certain or uncertain knowledge, as well as contested or complete consent (see Figure 2.2).

It can be seen from the situation shown at the top left of the Figure that when we are in a situation where knowledge is certain and consent is complete, the problem will be technical and can be solved by calculation. Whereas the bottom left shows the consent changes to be contested where the knowledge remains certain disagreement will rise and the solution may be coercion or discussion. However, when the knowledge turns out to be uncertain and the consent is complete, the problem comes from information and should be solved by research; this shows on the top right. Finally, the bottom right indicates that when we are in the situation that knowledge is uncertain and consent is contested, both knowledge and consent will be problems without solution.

Figure 2.2 Four types of problem risk

Consent	Knowledge: Certain	Knowledge: Uncertain
Complete	Problem: Technical Solution: Calculation	Problem: Information Solution: Research
Contested	Problem: (dis)Agreement Solution: Coercion or Discussion	Problem: Knowledge and Consent Solution: ?

Source: Risk and Culture (Douglas and Wildavsky 1982: 5)

Understanding the internal problems of the culture may be one of best ways to alleviate risk. For instance, in order to avoid tragedy from nuclear toxic wastes, Douglas (1986: 22-28) demonstrates three different approaches to risks in the nuclear community. Firstly, the engineering approach assumes that people normally consider they ought to know all the details of the hazard or risk as engineers. Although people have rights to understand the facts, the speed of development of new types of technological risks seems to be too fast to inform people. Such kinds of knowledge are highly professional, not like the basic training education. Engineers have an obligation to calculate the possibility of risk and to avoid the risk of injuring citizens who may be surrounded by the risk.

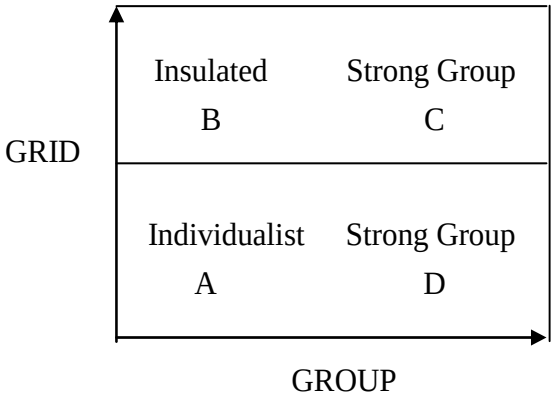
Secondly, the ecological approach is focused on distinguishing hazard from risk. It is a bridge between plant ecology and human ecology. Technology itself sometimes also causes new risks for the environment, not only benefits. The demarcation between natural causes of risk and man-made ones may be debated according to culture. The rat example is a good case. People may associate the rat with potential risks for the environment or for the health of residents in most countries, because it is a source of infection that causes diseases. Technologies in such countries are developed to reduce the reproduction of rats and to kill them. Whereas, rats are the spiritual symbol for

believers in India, who seem to believe that they may communicate with their ancestors and spirits through the rats. The monks rely on technologies to protect rats and to avoid them being killed by cats or other animals in the Karni Mata temple.

Finally, cognitive science tends to dominate risk perception. It signifies that not only should the engineers educate people in risk perception to reassure them about risks, but they should understand local culture as well to make their explanation acceptable to them. In this case, risk is not only the probability of an event but also the probability of its outcome, which is the main factor influencing human value judgment about risk (Douglas 1992: 31). Cultural theory provides a powerful explanation of risk. Each culture may be constructed by local lifestyle, custom, religion and environment, and different types of culture select different kinds of function to maintain their safety and to solve their problems (ibid: 46).

Therefore, Douglas (1978: 7) describes four types of social environments to measure the different social contexts (see Figure 2.3). As can be seen, the low grid/ low group (A) culture is individualist. There is no corporate solidarity within this group. The boundary and definition of group (A) are based on the individual him/her self in which individuals are not constrained by powerful institutions norms or bureaucratic rules. Then the high grid/ low group culture (B) comprises isolated and alienated individuals – artists and adventurers, for example. The third is high grid/ high group (C) culture which is more likely to be regarded as traditional capitalist and bureaucratic institutions. There are many regulations and conventions in this system; the hierarchical rank is a typical variety. Finally, the low grid/ high group (D) culture is an egalitarian or collective organizational type, such as a religious cult or non-profit organization. They may focus on a common faith and have a flat organizational profile.

Figure 2.3 Four types of social environment



Source: Cultural Bias (Douglas 1978: 7)

Each culture may create its own ideas of what is normal or natural as a basic value embedded in people's belief through processes of socialisation, which can also be understood as the expression of a shared subculture. Although such shared cultures may be threatened by the emergence of new technologies that may have a great impact on the original culture, they also produce new social responsibilities and generate cultural reassessment (Douglas and Wlidavsky 1982: 35). Therefore, risk analysis can help find out the possible impact of an event or more general development that may happen in this culture, and the sort of response it is likely to produce. From a more practical perspective, analyzing similar risks may reduce the costs of the potential repetition of specific incidents (Douglas 1992: 30). Indeed, every society is unique, which attaches to the culture many visible and invisible risks coming from technologies. Such risks gradually corrode or bring about change in the society and culture. Cultural theory assumes that culture is a system and one that generates shared responsibilities. One living in this system has a responsibility to help others who are in the same position, making the culture fulfill the political role of mutual accountability (ibid: 31).

Society is always focused on acceptable risks which political systems and politicians are more willing to take responsibility for. Most politicians would like to conceal a risk longer, when it is just a potential problem. This issue has been discussed in books by Ulrich Beck. In his *Risikogesellschaft* he examines hidden, intangible risks and the 'manufacture' of risk in the 'risk society'. Unlike Douglas, he does not relate risk to different types of social groupings/order but to more general processes he believes are at work across society.

2.6.3 Risk society

Beck's writings on risk society are underpinned by the concept of reflexive modernity. He argues that in a risk society the democratically structured institutions not only deal with risks but also continue to produce new risks (see also, Lash 2000: 50). Risks are caused by the technological production and unpredictable side effects from the very management of risk itself (Lupton 1999: 4). Beck (and Giddens, 2009) believe that the uncertainty of risks is not caused by risks themselves, but by the side-effects created by technologies and risk management in modern society.

From a sociological and anthropological point of view, Beck (1992b: 4) presents three observations on risk, firstly, parts of physical risks are created and affected by the social

system itself; therefore, both the monitoring and control of risk is one of the important tasks for organisations. Secondly, in dealing with physical risks the constitution of social relations and processes perform a direct function. Finally, most risks may come from the social dependency upon institutions, including some technically intensive activities. Therefore, the responsibilities of controlling risks in social systems are not only to deal with the risks they face, but also to prevent the new risks they may create in the future.

However, features of daily life and risk may change quickly in a modern society, and many factors in risk society need to be taken into consideration such as the extent type of hazard, the elements of the threat, the population concerned, and delayed effects. The focus of scientific research on such factors becomes narrower and narrower, and more specialist (Beck 1992: 54). At the same time, risk society emphasises that modernity is 'contingent, ambivalent and susceptible to political rearrangement' (Beck, 1992, 1994, 1995, 1996, 2000: 222).

Consequently, Beck presents eight major points on the sociological concepts of risk and risk society. First, risks are not the same as destruction; they do not refer to damages incurred but to the threat of damage or destruction. Second, the concept of risk reverses the relationship of the past, present and future, the interaction and causality among the three phases relating to each other. Third, risks are related directly and indirectly to cultural definitions and the standards of a tolerable or intolerable life. Following this, from a political and sociological point of view, risks and risk perception are unintended consequences of the logic of the role of the nation state in modern society. Next, the contemporary concept of risk is associated with manufactured uncertainty and indeterminacy. Then the new types of risks are simultaneously local and global, they are universal and may be caused by the air, the wind, water or food chains, with no boundaries. Lastly, the concept of a world risk society is connected with a world which can be characterized by the loss of significant contradistinction between nature and culture. The loss of boundaries between these realms is not only brought by the industrialisation of nature and culture but also by the hazards that endanger humans, animals and plants alike (ibid: 212).

Indeed, science and technology are not only inevitably concerned with the prediction of risks, but also contributed to the new discoveries of threats to society (Giddens 2002: 3).

Giddens suggests that the best way to understand the problem is to make a distinction between two types of risk: external and manufactured risk, especially in a global society. External risk is the experience of risk coming from the outside of a society, such as the traditions, cultures of other societies or nature. Manufactured risk refers to risk situations within systems. For instance, the genetic engineering may increase a crop's resistance to pests; but if this kind of resistance spreads to other plants, it may be a threat to biodiversity in the environment (ibid: 33).

Beck (1992c: 2) suggests three senses to describe how the global society understands itself. First, risk has become a public issue, especially in term of some potential threats to global society. Second, more and more international organisations, particularly in the policy field, have built co-operational mechanisms to deal with the dangers accompanying the development of global systems (and their potential risks – such as in financial systems). Third, the conventional boundary of politics has been eroded, because it becomes more difficult to deal with both visible and invisible risks locally in a world risk society. For example, ecological problems have caused many disputes and conflicts among European countries as well as in the developing countries (ibid: 3).

In the risk society, the present is determined by the consequences of the past. Moreover, the causes of present experience and action are the foundation of the future. Talking about risks, some people pay little attention to them, if they do not create any immediate threats to society. Nevertheless, some people believe that in order to deal with risks, scientists should develop advanced technologies, which makes risks essential factors to stimulate technology development. The more efforts people make to prevent risks today, the more threats brought by risks can be alleviated in the future, but new risks created too (Beck 2001:100).

2.7 Conclusion

In this chapter I have discussed the historical background of risk and offered some arguments about the meaning, scale, standard and evaluation of risk. Risk evolved from an abstract concept to one referring to both visible and invisible threats, from the highly localised societies of the Middle Ages to the world risk society of today. In practice, the acceptability of risks may vary from person to person. The scope of risk tolerability may range across different levels: it may be influenced by one's personality at the individual level; local cultures have their own customs and traditions reflecting ethnic or religious

beliefs, while countries have societal-wide discourses of risk that are enshrined in their regulations and established by the rules or laws enforced and controlled by organisations at the national level.

Foucault argued that individuals govern themselves when risks occur in their daily lives. The endurance of scale, harm and influence of risk may vary and the presupposition is of risk at the individual level that may not extend to the wider organization or society. However, Foucault argues that there is a direct relationship between self-governance of perceived risks and the wider societal disciplining of populations as a whole.

Douglas argues that each culture may have its unique characteristics or traditions from the accumulation of life experience, the tradition of religion or the characteristic of a particular society so it is unfair to judge or criticize the ways used to deal with risks in different cultures. Each culture may develop their unique characteristics, regulations, skills, or laws to control or handle risks in their territory, reflecting the ways in which what Douglas calls their ‘solidarity’ is expressed. This she represents in her grid-group model.

Beck highlights that the new types of risk which have been created by innovative technologies are typically outside our experience in the past. It is hard to resolve such risks by counting on our life experience or by analysing historical records. One of the possible ways may be to rely on technologies to prevent or evaluate the potential and invisible threats even to monitor the human activities around the world, although new risks may accompany the use of such technologies. For risk governance, it is unavoidable that citizens may have to accept a degree of intrusion on their privacy or freedom through the surveillance required for preventing potential threats.

Indeed, different organisations, cultures, societies and countries have developed multiple systems and skills to monitor or manage both visible and invisible risks. As Nowotny points out, however, scientists design possible ways to deal with any potential or real risks, but need to develop a form of reliable knowledge about risk that fits the needs of citizens, their cultures and the customs of society. If the need is secured, a form of risk governance based on “socially robust knowledge” can be achieved. The aim of my thesis is not to judge the moral issues of risk management, but to explore how such a system works in a modern technological society (Taiwan), and within this context a society that regards technology as providing a means through which social ordering and

the management of risk can be enabled. Therefore, I focus on a risk management system, which is designed by a governmental agency, relying on modern technology to identify, integrate and manage the phenomena of risks and 'accidents' occurring in everyday life in schools and colleges in Taiwan. There are therefore some key questions which my thesis tries to explore:

- What is the scope of risk which is created by these everyday events and how are risks organized or sorted (Bowker and Starr, 1999) through a process of classification?
- How, as a result of this, is the severity or seriousness of the risks calculated and standardized by the organization?
- How far does the personal perception of the risks by managers conform to or modify the formal meanings of risk as set down by the system?
- How does the management of risk reflect the wider context within these hierarchical organisations?

In answering these questions, while the ideas of Foucault are helpful especially in regard to understanding the role of surveillance in managing risk, and Beck's in terms of the way technologies both manage yet create new risks, I will draw my main conceptual framing of risk from Douglas as her work enables me to explore the structures (both organisational and cultural) through which risk is managed. This is a key to help understand my case study. The next chapter discusses the methodology I use and explains how I chose a specific system for my case study and how I designed my fieldwork to collect the data I needed to answer my research questions.

Chapter 3: Methodology

The previous chapter presented an overview of the literature on risk culture, society and governance, and discussed their relationships within technological society. This chapter introduces the research methods and illustrates how I chose the case studies from an empirical perspective.

3.1 Introduction

In a technological society culture, knowledge and technology play significant roles in shaping risk governance. Such factors not only enable people to deal with some potential hazards or risks that may come from different corners of society but also help scientists analyse and collect more data and information about the technical management of risk. The operational abilities and practical databases generated for risk governance could be improved, if people integrated and understood the relationship between those factors. Sometimes risks may be the side products of the process of social change, which make them unpredictable and unavoidable. Also there are no perfect and universal methods for social science research. Sometimes social scientists in different fields may choose various research tools or kits, use them in different ways, and interpret the results as the effects of using them differently (Gomm 2008: 1).

The literature review chapter has identified four questions which form the focus of my thesis. How is risk defined and classified and how do organisations attempt to manage it? How are risks calculated and standardized by an organization? How far does the personal perception of the risks by managers conform to or modify the formal meanings of risk as set down by the system? How is the context of a hierarchical organization shape risk? However, to find a practical case to answer these questions and how to choose events as an exemplification of these processes means that a specific case study will have to be chosen that illustrates these processes at work. My thesis tried to answer those questions through the collection and analysis of a socio-technical system, within a particular organization. The following section discusses how I developed the methodology and chose the methods for my thesis.

3.2 Methodology

The purpose of my thesis is to explore the connection between diverse threats and actual perceived risks, and explore the socio-technical processes through which this occurs,

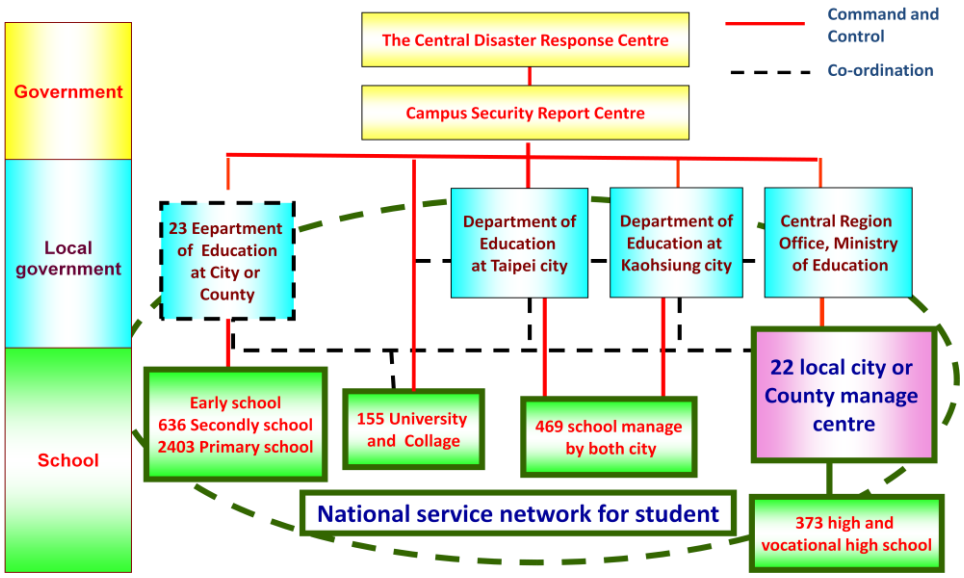
and to discover the possible trends of risk events and to identify the potential threats coming from risk. My thesis focuses on a management system, in which the cultural frame is characterized as being a high grid/ high group pattern, as Douglas (1978: 7) describes. This type of organization is likely to have many regulations and conventions that are designed to oversee and monitor the behavior of its members and to foster the effective coordination of activities within it.

This social ordering is reflected in the very structure of the IT system which is ordered in terms of a strong hierarchical structure and process. The system is called the 'Campus Security Report System' (CSRS), which has relied on technology to help the government agency manage risk events at the national level. The fieldwork for my research focuses on the data relating to risk events which has been recorded by this system, and draws on the concept of risk which the managers are expected to deploy, and the actual situation of the actors involved in managing risk in different positions across the system. I try, therefore, to understand the context of the system and the dynamics of the different social groups which are involved in this organization. To do this methodologically I will also draw on the Social Construction of Technological Systems (SCOT) (Bijker, Hughes & Pinch 1989: 28) perspective in Science and Technology Studies (STS) to explore the CSRS in my fieldwork.

3.2.1 The context of the CSRS

The Campus Security Report System (CSRS) was built to serve the education system in Taiwan but as such is shaped according to the existing educational structure itself. The function and data management of the system is illustrated in the following section and discussed more fully in chapter 4. The concept of the CSRS was constructed on the basis of a command and control relationship between the education system and the Central Disaster Response Centre (see Figure 3.1).

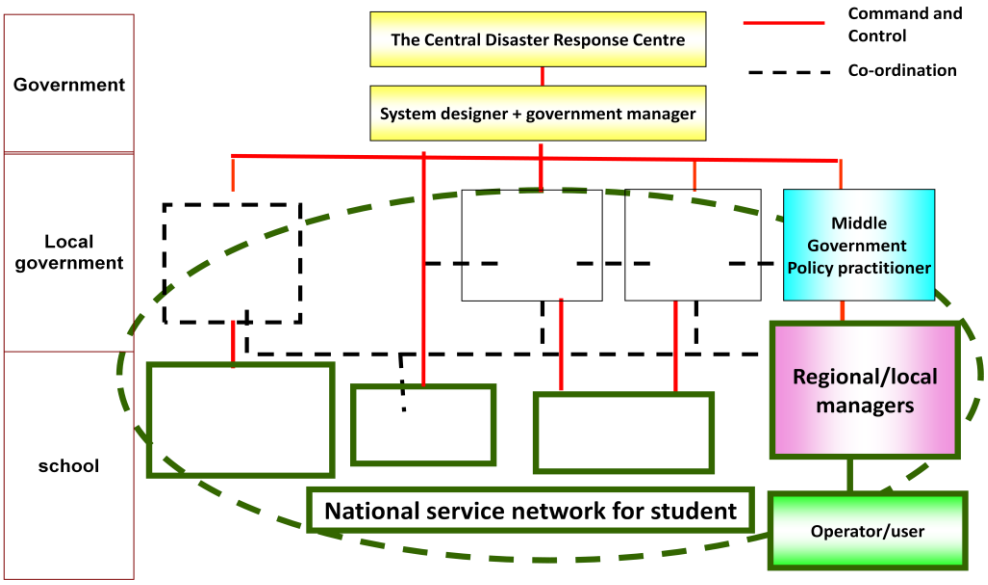
Figure 3.1 The structure of the Campus Security Report System



Source: Campus Security Report Centre http://csrc.edu.tw/ 20/03/2009

According to the structure, there are three management levels among the system from government to local government then to schools. The purpose of the system is to identify and thereby to control/reduce any risk-related security events which may happen at different levels of the school system in the country and record such events for policy makers. My thesis not only focuses on the system data but is also interested in the opinions and practices of operators of the system. Therefore, my thesis focuses on that hierarchical management structure represented by right hand side of the system (see Figure 3.2) and is interested in four groups of manager found at these different levels. Firstly, I focus on the system designer and government manager at the government level. Then the focus moves onto the middle government policy practitioner and regional/local managers at the local government level. Finally, the research explores the operators/users at the school level.

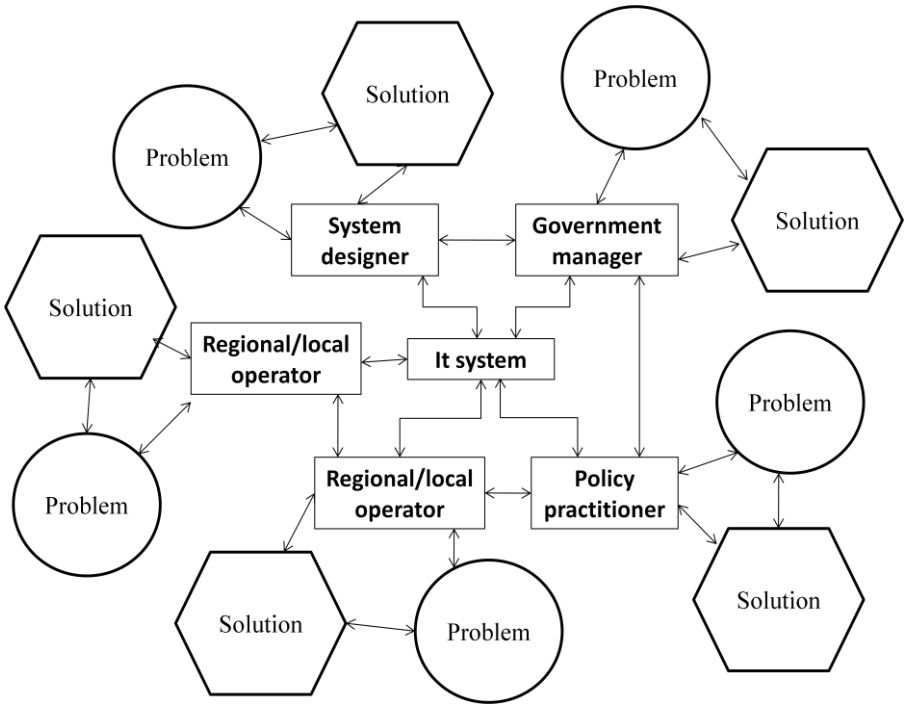
Figure 3.2 Principal respondents from within the CSRC management



3.2.2 The social actors /groups in the CSRS

My thesis explores the view point of operators across the CSRS which are collected from different levels of the system based upon the importance of seeing different interests and perspectives, as suggested by the SCOT approach. Bijker et al (1989: 28) highlight 'the developmental process of a technological artifact is described as an alternation of variation and selection'. The structure of the CSRS is built on an information technology (IT) system which relied on the IT system to link the relationships between the system designers/managers and operators/users. I explore the actual problems of operators of the CSRS and the solutions they deploy as different groups of people, which included the system designers, government managers, policy practitioners and regional/local operators (see Figure 3.3). SCOT is used here to help model social practices, while Douglas, to which I return later, helps provide a theorization of organizational structure.

Figure 3.3 Framing the CSRS according to the SCOT approach



As discussed above, cultural theory may provide us with some conceptual tools to help us to understand how organisations understand and deal with risk. As Douglas argues, there is a significant difference in the management of risk between individualistic and hierarchical organizational structures, which are in turn influenced by two factors, knowledge and consent.

The CSRS was built by the educational system which could be classified as a hierarchical organisation which expresses a high grid/group culture. According to Figure 3.1, there are four management levels among the government, local government and school. Culture theory tends to presume that the characteristic of hierarchical solidarity may generate a strong degree of social cohesion within organizations. However, while Douglas' model is useful in point us towards the broad patterms of integration that we should be looking for in organisations, it says little about the sort of interpretive processes that can be found therein and which reflect a range of localized concerns among their members. This latter issue can, it is suggested, be explored by drawing on the SCOT approach.

The SCOT perspective may provide a useful methodology for us to understand actual processes within the CSRC among different levels of managers. Combining both culture

theory and the SCOT approach to analyse the CSRC should help reveal the multiple view points and strategies we need to understand within the hierarchical organisation.

My thesis therefore not only explores the dynamic between the designers/managers and operators/users, but also seeks to understand the possible problems which they experience and the solutions they find to deal with them. The role of managers at different levels is described below, according to their position within the system (see Table 3.1).

Table 3.1 The role of managers within the CSRS

Job status	Principal role within the system
System designer	Design and develop the system according to government requirements. Maintenance and modification of the system
Government manager	Manage and monitor the system. Identify and update emergency events, control the following situation and provide possible support/resources for user. Report the event to the director of department.
Policy practitioner	Transmit the system management strategy. Provide guidelines for regional and local operators. Formulate the training plan for new operators and assess their skill to operate the system. Monitor the emergency event and provide any immediate support.
Regional/local operator	Establish the regional/local management role. Monitor the emergency event and report to policy practitioner and government manager. Provide possible support to user.
Operator/user	Establish the organizational plan for managing emergency events. Report the emergency event to system and regional operators as they occur.

My thesis focuses on three concerns: the identification and management of similar risks across different regions, the personal attitude of individuals responsible for dealing with risk within different organisational cultures (in the educational system) and the risk governance that can be seen in what are effectively hierarchical organisations. The research tries to compare similar events that have happened in different cities collected over a period of time through the use of an IT system designed by an official agency.

Firstly, this thesis attempts to explore the relationship between each risk around people's daily lives and tries to find out the trend of risk by analysing the historical record. Secondly, the focus of research will move onto the attitude of managers, who are the key persons facing and managing the risks and whose attitude may be influenced by the organisational culture. Finally, the research will focus on the opinions of risk managers

who deal with risks at dissimilar positions of work in hierarchical organizations. The following section explains how I chose the methods for my case studies.

3.3 Choice of approach and empirical subject matter

Good research data should cover as many variables as possible. Jasanoff (2005) compares in her "Designs on Nature – Science and Democracy in Europe and the United States", the new phenomena and the concerns generated by biotechnology between the United States and Europe. Moreover, Özerden & Jacoby (2006) in "Disaster management and Civil Society" highlight the different vulnerabilities in natural disaster of earthquake among three counties. Both studies adopted different research methods for similar research from social phenomena.

From the phenomenological point of view, some risks may be like an accident in people's daily life, happening at any time in any day just like a traffic accident. Some could occur randomly, once a week or once a month or even never happen at all for instance diseases. Some may be like chronic disasters which derive from natural change and happen in special regions or seasons with frequency of once a year or every ten years, for example, floods and earthquakes. Such events may not appear at the same time, but they have a common characteristic which is uncertainty. Although lots of high technological instruments today help with the improvement in the management of risk, no one can predict when risk events will happen.

Clough and Nutbrown (2002: 17) suggest that 'the selection of methods for research studies can only be made in the light of specific situations and particular phenomena'. Therefore, if a thesis tries to track the trend of risk events, one of the best ways may be to compare two or more different events at the same time. Such events may come from people's work experiences, their daily events or historical records from society. The following section introduces how my thesis approached the research methods and how I chose the suitable case studies for research.

3.3.1 Selecting the appropriate research method

Each risk has a special or unique characteristic, which may be influenced by specific factors, such as the characteristic of a region, the prevailing organisational culture or the experience accumulated from prior historical events. Most people believe that all the factors are closely connected and inseparable. No single factor can be picked out as the

major cause of risks.

However, there is an element that might be found in socio-technical risk, because in technological society many events are monitored by technology, especially computer systems. Consequently, technology is an essential element in modern society. After the invention of the computer, most governmental agencies rely on computers to manage enormous databases, because the managers at such organizations not only used computers to save general information about organisational performance but also analyzed the historical database to prevent or reduce risks.

In modern society, risks may be recorded by governmental or non-governmental agencies after they have happened. For risk management, parts of organisations might analyze the recorded figures, collect them in databases or exploit the data in shaping future policies. My thesis tries to integrate an analysis of recorded risk events with different regional and organisational culture factors, and to highlight the meaning of risk governance. Although organisations may have their own cultures or characters, it is possible to find out some correlation within them after comparing or contrasting two or more organisations with the same factors. Comparative research design is a kind of survey which compares two or more cases, and sometimes involves cross-cultural research (Bryman 2004: 53). Therefore, the research not only investigates the factors associated with risk in the technological society but also tries to find out the possible trend associated with a variety of events.

Yin (2009: 8) argues that both experiment and case study methods contain similar features or elements, after comparing five types of these techniques. The research questions of both methods are concerned with the complexity and particular nature of the case in question. Therefore, my thesis intends to use the case study approach to explore the contemporary events around peoples' daily life with similar characteristics. My thesis compares three kinds of data from a risk governance system which relies on technology to manage a large database, provide a good communication channel for managers in hierarchal organizations and an extensive historical record all of which is designed to prevent future possible risks.

3.3.2 Choice of empirical subject matter

Based on the approach outlined above, the case study in my thesis was chosen from

people's daily events around them. Often, such events are ignored at the level of the individual; however, where an event creates a risk for the individual, then it may cause a chain effect that affects families, organisations and societies more generally. Risk management may not be avoided in industrial society and one possible way for managing risks may be by building a central coordinating headquarters that takes full charge of collecting and receiving information from varied sources in the field (Barton 1969: 171). However, there is a dilemma for a hierarchical and rigid culture when facing an extreme crisis, because some dominant carrier cultures might be incompatible with the immediate needs and requirements for decision-making during periods of crisis (Rousseau 1989; Pidgeon 1997: 7).

My thesis concentrated on the management function of risks in a hierarchical organization which handles all security events that happen in schools around the country (R.O.C Taiwan). The mix methods are applied to analyse the campus security events over a period of time and to evaluate the opinions of system operators and designers. The first part of the case study focuses on the Campus Security Reporting System (CSRS). This system is a channel for school managers to report campus security events involving students and staff to the Campus Security Report Centre (CSRC) in the Ministry of Education in Taiwan. The actual role of risk management in this case is located at a national level, and is monitored by the Taiwanese governmental agency.

The second part of the case study addresses the attitude of the staff that operates the CSRS. For any level of school, it is imperative for them to understand as many risks in their surroundings as possible, because safety may be an important issue for students at school. Therefore, school managers not only have responsibility to provide a safe learning space for students, but also to assess potential risks for the staff and students at school. The research focus of this aspect of my case is to understand the attitude of the staff when they operate this system at school, and to collect their experiences in dealing with or facing the emergency event which was caused by students or staff at school. The purpose of this research is to explore the attitude of school managers in risk management, and to discover the relationship between formal procedures they are expected to follow and what actual practice takes place when dealing with risk events at school.

Finally, the third dimension of my case study moves onto analysing more specific

opinions from the local operators or managers at schools in some cities in Taiwan, as well as the system designers and more senior managers within government departments. The research in this case focuses on the personal knowledge of governing risk events and the function of the CSRS. The research tries to distinguish differences between the local and government managers in using or managing the CSRC. Therefore, the research design in this thesis focuses on three parts of cases: the analysis of a database from the CSRS, the survey of operator opinion through a questionnaire and the semi-structured interviews with local operators, system designers and managers within the government department.

My thesis attempts to understand the dynamics of risk management through comparative research. Also, it hopes to explore the relationship between organizational culture and personal attitudes in dealing with risks, and to discover what, using a phrase from Nowotny (2000: 117) one might call a 'socially robust' approach towards effective risk governance. The following section describes the details of the research methods and the source of data for each case.

3.3.2.1 The Campus Security Report System (CSRS) in Taiwan

Exploring the CSRS is the first part of the case study in my thesis. This system was designed by the CSRC in the Ministry of Education in Taiwan in July 2001 and used to integrate risk-related information when specific events happened at school around the country. It provides an official channel for administrative agency to monitor every accident and disaster event, including both man-made and natural disasters (CSRC 2003). The system was built on a directive from the Ministry of Education in Taiwan. According to the directive, every institution including private and public schools, should establish a secure place and procedure for recording, managing and controlling any campus security events and the possibility of a major disaster.

The instruction within the directive asked every educational institution to maintain a room with fax machine, telephone, internet and other support facilities for dealing with risk or controlling disasters. Schools not only should prepare a campus disaster management plan but also have to evaluate the potential risks within the school's property such as aged buildings or dangerous intersections. Also, every administrational department has to provide one or more persons standing by for emergency contact. If any security event or disaster referring to the student or staff happen, no matter on or off

campus, those staff who stand by in this command centre should report the condition to the CSRS immediately and continually report the latest development.

In Taiwan, there is a group of special staff from the Ministry of National Defense working in the educational system. They are actually appointed by the military to be responsible for the security management on campus and the teaching in a general sense about military and national security. According to the Ministry of Education, there were 1062 military staff at 161 Universities (including Colleges) and 2726 military staff at 487 high schools around the country in 2009. Therefore, if there is any campus accident tallying with the events listing on the Category of Campus Security Event List (see Appendix I), all the information about this accident should be reported to the Ministry of Education via the CSRS and recorded in the database. My thesis will analyse the database, to which I managed to secure full access, collected in this system over past five years. The research design in the first part of the case study will discuss three questions about this system.

. Can we find any trend in risk events and their reporting (and classification) by analysing the CSRS database?
. Is there any difference in risk governance between urban and rural areas?
. Can we find any change through analysing the historical record data?

The CSRS has been running for eight years up till 2008, and has accumulated abundant data in the system. In the early period, the system may have experienced some failures or needed retesting caused by the unfamiliarity of the operating system during the initial period. Therefore, the analysis of data focuses on the middle five years, from 2004 to 2008.

3.3.2.2 Personal attitudes of operators with the CSRS

The second part of the case study moves onto the opinion of those operators who are responsible for operating this system. My research focuses on parts of the staff working at high school who have experience in operating this system. According to the Ministry of Education, there are 487 high schools in the country. My thesis focuses on 393 high schools managed by the Taiwan Province, because nearly eighty percent of high schools are managed by this administration system in Taiwan. I chose this bureaucratic system, because it has a more integrated and developed command structure (see right framing of

Figure 3.1) within the whole educational administrational system. Therefore, the research will ignore the other ninety-four high schools managed by the two other municipalities (Taipei and Kaohsiung).

The samples of this survey collected from 393 high schools in Taiwan Province. There are approximately 2,013 staff assigned to manage and operate this system at these high schools. I designed a questionnaire for the pilot test, and collected the opinions during this pilot stage from twenty respondents from 1st April to 30th April (see Appendix II). The questionnaire includes five parts of the issues, and they are broken down into forty questions, in total. The first section relates to the candidate job background. Then the second part of questions are concerned with their personal experience; after that, questions focus on their opinions on operating this system. Following this, the questions address their personal opinions about the organisational culture which relates to their work place. Finally, the questions will move onto the personal experience about how to face and to deal with the campus security events. The research tries to explore the actual situation and process of risk management from the experience of the staff. Therefore, my research tries to discover answers to the three questions below:

. Did the CSRS provide a good communication channel between high schools and the Ministry of Education in reporting campus emergency events?
. Is there any impact on managers on the risk governance at school caused by the organizational culture ?
. What kind of attitude can people learn for facing risks in a socio-technical society from risk managers?

3.3.2.3 Interviews with local operators and the system designer

After accumulating wide opinions from some school staff collected by the quantitative survey during the second part of research, the semi-structured interview is applied in the qualitative data assembled during the third part of my study. The research design in this case explores and seeks to understand the personal experience of those in the CSRS from operator to manager level. Therefore, the interviewee respondents include junior staff (working for less than one year), senior staff (working for over five years), head of the department at high school, local and centre managers at city or county, system designers and system managers.

In order to understand the variation of the staff experiences between city and countryside, five cities or counties have been chosen in my thesis to compare the diversity. The samples were determined by three factors: the location of the city (the north or south of the country), the category of the school (public or private), and the regional location of the city (urban or rural). Also, my research tries to examine and compare any differences between local and centre managers. Therefore, the samples include city/county managers and directors, system designers and managers at governmental department.

The goal of this part of the interview was to collect thirty to thirty-five samples. The interview questions contain four main issues: personal background, operator experience, personal attitude to the system function and risk management. Each part of the point would be separated into several questions. There is a slight difference between questions for operators and for system designers or managers. The first part focuses on the operators; there are twelve questions for them (see Appendix III). Then the candidate for interviewee will move onto the system designers and managers. Questions for them are also designed with four parts and are separated into twelve questions (see Appendix IV). These parts of case study are used not only to discover operators' personal experience but also to explore the diversity between system designers, managers and operators.

Campus security events may appear once or many times a day, a week or a month; most of them cause slight injury for people; however, sometimes they may cause a serious harm for students, staff or loss of campus property to school. I tried to explore the more specific opinion from different groups of people including operators of the CSRS. The research design in this case focuses on three issues.

. How does the governmental agency record data of campus security events to monitor potential risk that may happen in the future?
. What is the main relationship between organisational culture and campus risk in risk governance?
. Are there any significant differences in using or operating the technological system of risk governance between local operators and high level managers?

3.4 Methods

The last section shows how I chose the specific case for my thesis, and the following section will delineate how I approach the research methods in this thesis. If a thesis tries to explore a phenomenon, normally data will be the kernel of the research. Although people are surrounded by information and are bombarded with it every day from the media and elsewhere, usually, most data are ignored by us and it is hard to collect correct data straightforwardly. If people misunderstand the importance of the data for society, they may need some plans with actions which could identify and use the most effective and appropriate method of data collection (Walliman 2006). The nucleus of my research addressed the performance of the campus security management system which provides a function for hierarchical organizations to manage and handle risks.

Risk is uncertain and hard to be predicted, there is no absolute answer to explain the reason risk happen, but through the explore of organizational culture may find their way when encountering it. In addition, good research may involve the study of naturally occurring settings or associate with studying artificial setting of social movement which are established by people activities or culture shaping (Bryman 2001; Seale 2004: 294). Social and cultural research often emphasizes the differences between qualitative and quantitative methods; qualitative methods tend to link with interpretivism and postmodernism, and the interpretivism may help research explain the context of events. While quantitative methods tend to link to positivism which may help achieve the support of research finding (ibid).

However, some people may argue that the assumptions behind qualitative and quantitative methods for the nature of the social world are fundamentally different (ibid). My thesis tries to find out what are the different perceptions among those in handling the campus security events and in operating the CSRS between local (primary) school managers and governmental (senior) organization managers. This thesis adopts a mix-methods approach, including the case study, quantitative research, qualitative research, long-term research and interviews. The following section will illustrate how I use those methods in the research design for the thesis.

3.4.1 Case study research

Case study acts as a key pivot of the thesis. This research tries to discuss some issue in

three cases: similar risks at different regions is the main focus in first part of case, personal attitudes with the organisational culture is integrated in the second part of case and the risk governance in hierarchical organisation will be the focus for analysis in the third part of case. Normally, a case study may be concerned with the complexity and particular nature of an area of society. Therefore, the samples for the case may be from a single community, school, family, organization, person or event (Stake 1995; Bryman 2004: 48).

The case study may involve both single and multiple parts of case studies. It is not only a form of qualitative research but also may admit among an array qualitative research choices (Creswell, 2007; Yin 2009: 19), for example, both participant observation and unstructured interviewing research designs are favoured qualitative methods because these methods are viewed as particularly helpful in the generation of an intensive, detailed examination of a case (Bryman 2004: 49). Some case studies go beyond being a type of qualitative research, inasmuch as they could combine both quantitative and qualitative evidence for research (Yin 2009: 19).

However, there is a variety of applications in the case study. Firstly, it may illustrate that the assumptive causality relates to real-life interventions, normally, which is too complex for the survey or experimental strategies. Secondly, it can describe interference and the real-life context in which it occurred. After that, if research design needs to evaluate or to describe certain mode, the result of the case study may provide adequate evidences. Then, when the situations are influenced by some intervention which causes the evaluation unclear or confuses the outcome, the case study may enlighten this problem. Finally, many different motives may be conducted and be written by the case study. Such motives may be from the individual case that provides simple presentation to the broad generalisation; it depends on the evidence of the case study, respectively (ibid).

My thesis compares some opinions and experiences from operators who manage or operate the technological system on risk governance. This research will link the relationships among three elements with region, organisational culture and risk governance. The three parts of data sources are the database analyses of the Campus Security Report System (CSRS) in Taiwan, the questionnaire survey with operators' opinions about the CSRS and the face to face interview with primary and senior

managers. Quantitative method is applied for analysing the data of the CSRS in the first part of case study, the questionnaires data in the second part of case study and qualitative method for collecting the personal opinion from face to face interview in the third part of case study.

3.4.2 Quantitative research

If a researcher tries to provide wide evidence for the discovery of result, more specific opinions from wider range of participators are needed. Quantitative research may be a good choice to generate additional data in case study in that it may cover some behaviors or events that researcher is trying to explain. Also, the data related to an embedded unit of analysis may be critical in explaining the key proposition (Yin 2009: 133).

Although most quantitative researchers rely on a positivist approach in social science research, they may use a technocratic perspective, apply reconstructed logic and follow a linear research path. And they may try to explain some general causality which depends on measuring variables and testing hypotheses (Neuman2003: 139). Therefore, there are some advantages of using quantitative research for example it may provide more complete relationships between variables and dependent variables. Also, the research results may be influenced by the choice of samples as well as the comparison and contrast of the variables. Then the results depend on the classification system which may form group studies or homogeneity. Finally, quantitative research informs strategic plans for future research and shows the social science findings which may be compared with the natural science (Krathwohl 2004: 562).

In addition, there are some functions of quantitative research. Firstly, it may help us test the hypothesis that research begins with. Secondly, the concept of research relies on distinct variables. After that, each measure in research is systematically created before data collection and standardization. Following this, data are in the form of numbers and in principle allow precise measurement. Then theory is largely causal and deductive. Also, the procedures are standard and the replication is assumed. Finally, the procedures normally involve statistics, tables or charts and a discussion of how they relate to hypotheses (Neuman 2003: 145).

The quantitative research approach in my thesis is exemplified in the first and the

second parts of cases. The main attention will focus on the records of the campus security events for five years, which is collected in the CSRS at the Ministry of Education in Taiwan. I tried to find the trend in risk patterns from the system record and to establish some key factors for risk governance.

The second quantitative research element will move onto the workers who operate the CSRS at high schools. The research design involves a questionnaire which includes five subjects: personal information, personal experience and opinion about the system, personal opinion about the organisation culture and personal experience about the student accident event (see Appendix V). The pilot test was conducted in April 2009. The questionnaire was sent to the school managers at a training conference in July 2009 in Taiwan. The attendees were the staff playing the roles of operators of the CSRS at the high schools.

3.4.3 Qualitative research

Sometimes research may find some trends from social phenomena through quantitative research. However, if a researcher wants to explore the meaning behind the presentation of large-scale accounts of social phenomena, those data may be collected by recording respondents' experiences through an interview. Such research may be designed with experimental research, social survey or the discursive interviews of qualitative research (Gomm 2008: 208). Therefore, some research may use a language of case and context, examine social processes and cases in their social context, and look at illustrations or the product of meaning in specific surroundings (Neuman 2006: 157).

The function of qualitative research is not merely for counting and dealing with numbers but also focusing on the information which illustrates the words-descriptions, accounts, opinions, feeling of people, particularly, in small groups or individuals. Nevertheless, it is impossible to determine or predict precisely what data may be collected before the survey (Walliman 2006: 129). However, there are five suitable purposes for qualitative studies: understanding the meaning of the events which may involve people's lives and experiences; understanding the particular context and the influence from the context of actions; identifying unanticipated phenomena or influence, and producing new grounded theories; understanding the process which may be caused by events and actions; developing causal explanations (Maxwell 1996: 17).

Because of its elasticity, qualitative research is broadly used in social science research. For example, the generation of results and theories are understandable and experientially credible to researcher and respondent; conducting formative evaluations are intended to help improve existing practice; engaging in action research with practitioner participants ensures they have an impact on the results generated and outcomes and actions they lead to (Maxwell 1996: 21). Qualitative research reveals the complexity within phenomena. And it may be extremely useful for exploration of how to sense a phenomenon (Krathwohl 2004: 229). Also, it may interpret human problems and concerns; make people, problems, and situations "come alive"; portray phenomena in their context; describe complex personal and interpersonal phenomena that would be impossible to portray with quantitative research's single dimensional scales; provide a holistic view of phenomenon; help get inside and help handle problems (Consider 1995; Krathwohl 2004: 562).

My thesis contrasts the cross-data analysis and comparative data with the method of qualitative to explore the relationship of socio-technological risk governance from two factors: the organisational culture and the cognitive difference with risk governance in hierarchical organisations. My research design adopts the use of the interview survey on three groups of people. The first group focuses on the junior staff, the senior staff and the heads of department at high schools. Then the interviews move onto managers and directors in five different cities. Finally the research focuses on the senior managers who are system designers and governmental level managers. After the interviews, I integrate the respondents' opinions, which may show us the wide range of attitudes among people distributed at different levels of organisation when facing and managing risk, and compare the similarity or difference of experiences in managing risk-related events to describe how the situation varies across different organisations.

3.4.4 Long-term research

Both the questionnaire and interview are the main methods for collecting quantitative and qualitative data in my thesis. They may help discover the significant trends in socio-technical risk from quantitative research, and explore the meaning-related factors of risk from qualitative research. However, such results may be like a mirror showing only part of the puzzle in the life cycle of risk. Therefore, if a research desires to find out the complexity of risk, long-term research may be one of the fundamental demands.

Long-term research is also called longitudinal research; it is one of the best methods to contrast cross-sectional research. The cross-sectional research design collects one or more variables in the same period of time. However, the data collected in the longitudinal research may come from more variables of events and longer periods of time, which could provide at least a calculation of change and a conceivable illustration of change (Menard 2002; 2008: 1). Therefore, if a research can follow up the same sample for a long period of time, the researcher may discover what things happen and treat the problem of causation with more precision (Seale 2004: 343).

Although longitudinal study benefits from controlling time order problem, there are still some unavoidable concerns for research. For example, it is very expensive because more data need to be collected and a large sample has to be kept in touch with, which increases the difficulty for the research (Seale 2004: 343). Thus a researcher may needs to assess the intention of the research design before using a longitudinal study. There are four basic designs for longitudinal research: total population designs, repeated cross-sectional designs, revolving panel designs and longitudinal panel designs (Menard 2002; 2008: 4). My thesis applies cross-sectional designs at the first case study and tries to measure the five-year database collected by the CSRS. Although campus security events may be a different set in each case at different times, they still can be comparable with each other.

3.4.5 Interview

The most important information in a case study is from the interview (Yin 2009: 106). The major method of data collection in my thesis depends on the qualitative research, and the function of support for data assembled comes from interviewee's respondents. Seale claims that nowadays people live in an interview society; the interview has become increasingly public compared to the past of our lives (Silverman 1997; Seale 2004: 105). In qualitative research, the interview is probably the widest employed method (Bryman 2004: 319), it may produce dissimilar classes of information from individuals or groups, which makes itself a highly flexible and unpredictable instrument for social research (Seale 2004: 180).

Sometimes sociologists may be interested in the attitudes of some specific social groups, or engage in the study of people's feelings. One of the key methods of attitude research is the interview (Gilbert 2001: 123). Interviews may provide essential sources of

evidence for a case study, if the case study is about human activity or behaviour. Also, it may furnish important insights into such affairs or events. The interviewees also may highlight shortcuts which could help a researcher to distinguish other connected information of value (Yin 2009: 108).

There are two tasks for researchers when they use interviews in research. The first thing is to follow the line of inquiry and to observe the research protocol. Secondly, researchers may ask more conversational questions in an unbiased manner which assists the richness of inquiry (Yin 2009: 106). Thus, researchers may be careful in both satisfying the line of inquiry for data collection and using nonthreatening questions for interviewee at the same time in the interview.

Furthermore, three conditions may be noticed in the interview. Firstly, each individual opinion is seen as the source of subjective meaning. Secondly, from the psychological point of view, data collected from interviewees may explain an experience or personal narratives. Finally, both interviewer and interviewee should be satisfied with the aims and methods (Silverman 1997; Seale 2004: 105).

Generally, there are three types of case study interview for researchers: in-depth interview, focused interview and structure interview. In in-depth interviews, the researcher may ask key respondents their opinions about events. They also may ask the interviewees to propose their own insights into certain occurrences and may use such propositions as the basis for further inquiry, not just a single sitting. The interviewee also may suggest other persons for you to interview, as well as other sources of evidence. Then the focused interview may ask interviewees for a short period of time such as an hour. Researchers may still remain open-ended and assume a conversational manner, but they may be more likely to follow a certain questions derived from a protocol. Finally, the interview may entail more structured questions, consistent with the limits of a survey, which may be designed to produce quantitative evidence for the case study (Merton, Fiske, & Kendall, 1990; Yin 2009: 107).

In a technical society, more and more researchers rely on e-research for research because it is more convenient and cheaper than face to face interviews. However, some concerns may be assessed before an e-survey is used. For example, authenticity, any one could set up in an open web site, which makes it difficult to control the respondent; and the credibility would be a big problem as well. Doing e-research one needs to be aware

of possible distortions from web site because it is crucial for a researcher to distinguish the respondent background from e-survey (Bryman 2004: 390). Consequently, my thesis focuses on face to face interview, which may achieve some benefits to support my research. Firstly, it may be easy for researchers to maintain rapport with respondents. Secondly, it may help researchers gain more commitment and motivation from interviewees. Following this, it improves the success rate for the survey and reduces the impact on data collection. Finally, it provides follow-up probes chances for research (Curasi 2001; Bryman 2004: 479).

Therefore, the survey in my third part of the case is designed using a semi-structured interview. The choice of respondent has been described in 3.3.3 section. The interview questions were evaluated and piloted, and were extended when needed during the progress of the interview. By doing so, the data provided richer and wider information for the research.

3.5 Data collection

Today, more and more social science researchers rely on technology software to analyse databases because it provides effectiveness for information management. There are three possible ways which may help researchers key in data: direct automatic entry, automatic creation of computer files for importing into analysis and manual keying-in of data (Bobson 2002; Walliman 2006: 110).

The following section will describe how I undertook the fieldwork to collect the data for my thesis. The first step was to collect the database of the campus security events over five years, those recorded by the CSRC by the Ministry of Education in Taiwan. Before doing this case study, I obtained an official document which gave me admission to apply for the data for analyses (see Appendix VI). In the CSRS, the number of recorded data about the campus security events is 117,066, between 2004 and 2008.

The second step in my case focuses on the opinion of the campus staff at high schools. Following my pilot, the questionnaire was slightly modified. The modified questionnaire was completed by the staff responsible for operating the CSRS at the staff training conference between the 13th July and the 24th July 2009 in Taiwan. There were 1,154 questionnaire copies delivered and 1,055 copies returned. There were 805 valid responses and 250 invalid responses within the 1,055 returned copies.

Finally, the third step in the case tried to find out any significant differences in risk management between the high schools staff and the senior managers, from primary level to governmental level. The respondents involve the general staff and the heads of department at five schools, and their local managers and directors in five cities. After collecting the data, I found that most of the respondents were male with a similar educational background; therefore, I chose eight female respondents who were general staff with different educational backgrounds and who had worked for less than two years at the current schools they were based; also there were three volunteer respondents. Then the interviews moved onto two system designers and two governmental level managers. Therefore, the total number of interviewees was thirty four for this part of case study.

3.6 Data analysis

There is no doubt that one of the challenges for research is question design crucial to producing valuable and applicable evidence (Gilbert 2001: 86). If a researcher can explore the actual phenomena of interest through a survey, it may improve the outcome of research. However, sometimes similar data at different organizations may be recorded in different ways, which may create additional work for a researcher to interpret and summarize the collected data (Walliman 2006: 110). Therefore, one of the important tasks for researchers is to analyse data as effectively as possible following its collection.

This section illustrates how I analyzed the collected data in each part of my case. The first one involves the analysis of the CSRS database. Originally, each data item was recorded in Chinese in the CSRS so the whole data set was transformed from the original Chinese programming language to an Excel file. This step made it possible to convert and reclassify the meaning from a Word to a numerical form with codes. After that, the numerical data in Excel was used to copy to SPSS.v16 software. Finally, the numerical data was re-encoded to SPSS.16 software for quantitative analysis. The second part of the quantitative data was collected using a questionnaire. Section 3.4 has shown that the 805 valid respondents will be analysed by SPSS 16 software. The third part of my data analysis involves qualitative data which was collected through face to face interview. The interviews were followed by question sheets. Two different question sheets have been used in the interviews which depended on the interviewee's background. The total number of respondents is thirty-four in this part of the case study;

the choice of sample has been discussed in section 3.4. Each interview was been recorded by mp3 recorder. The interview data was recorded from voice to Word form, then verbatim input to Atlas.ti v.5- or Nvivo-9.

3.7 Research ethics

For research, data collection and analysis is essential work which must be informed by ethical consideration. One of the most important rules in ethics is to follow the policy of value neutrality. Researchers also have to keep in balance violations of privacy and confidentiality when publishing results (Gomm 2008:19) and avoid risk for respondents.

In recent years principles of ethical research have been designed by the Economic and Social Research Council (ESRC), which provide guidelines for researchers. For instance, the research subject, its purpose and possible risk must be explained to each person involved in the research. Also, the anonymity of respondents must be respected, and research participants must be recruited in a voluntary way. Then any harm to research participants must be avoided. Finally, the independence of research must be clear, and any conflict of interest or partiality must be made explicit (ESRC 2005; Gomm 2008: 366).

The research ethics of the thesis follows the principles of the University of York Humanities and Social Science Ethics Committee. Research Governance was approved by each organization, agency and individual involved in the case study before the research. For the first part of case study, I obtained an official document from the Ministry of Education, which confirms the consent given to the case study. In addition, the research subject and purpose have been described in full at the start of the questionnaire. Also, every interviewee read and signed the protocol before the interview started (see Appendix VII).

3.8 Reliability and validity

Research ethics, data collection and data analysis may focus on the goal of research; however, both the reliability and the validity of the research are also crucial issues. Reliability is usually a central concept in measurement. There are two main aspects in this consistency: consistency over time and internal consistency. Consistency over time is usually expressed in the question. Internal consistency relates to the concept-indicator idea of measurement described earlier. It is hard to reduce error variance in social

science, but error variance may present wherever measurement is used. Sometimes, our central strategies in research will account for variance in a dependent variable, it is necessary for researchers to estimate the reliability of all measures, especially the dependent variable (Punch 2005: 95).

In order to improve the reliability of this study, a pilot of the questionnaire for the second aspect of the study was conducted in April 2009, and twenty respondents returned the questionnaire which has illustrated in section 3.2.2.2. The respondents' opinions were then integrated in an updated questionnaire which is used in the following quantitative research. Furthermore, every question in each case study had been discussed with the researcher's supervisor and validated in part through discussion with a professional practitioner (in Taiwan) with work experience in this area before the question sheet was designed. Such techniques may improve the reliability of the thesis.

When dealing with the reliability issue, the aim of the thesis moves onto its validity. Validity refers to the truth-value of a research project; reliability concerns the consistency with which research procedures deliver their result. The measurement validity of questions in interviews and questionnaires can be improved by various methods (Seale 2004: 72).

Sometimes validity is more difficult to achieve than reliability; it refers to the bridge between the construct and the data. Consequently, qualitative researchers may be more interested in authentication than validity, because authentication means giving a fair, honest and balanced account of social life from the viewpoint of the subject (Neuman 2006: 182). My thesis relied on quantitative and qualitative data to analyse the CSRS data with a five-years-long database, and to collect the staff attitudes about using the CSRS within different organizational cultures and to distinguish any significant differences in risk management between the junior staff and the senior managers. The measurement error may be reduced by doing comparison across the three elements of my case study. Moreover, in order to improve the validity of the interview data, I asked a number of multilingual (Chinese/English speaking) researchers from different academic backgrounds to translate the same piece of qualitative data to compare those with my own translation: this gave reassurance that my own version captured the meaning of respondents.

3.9 The schedule of the research

Table 3.2 The schedule of the research

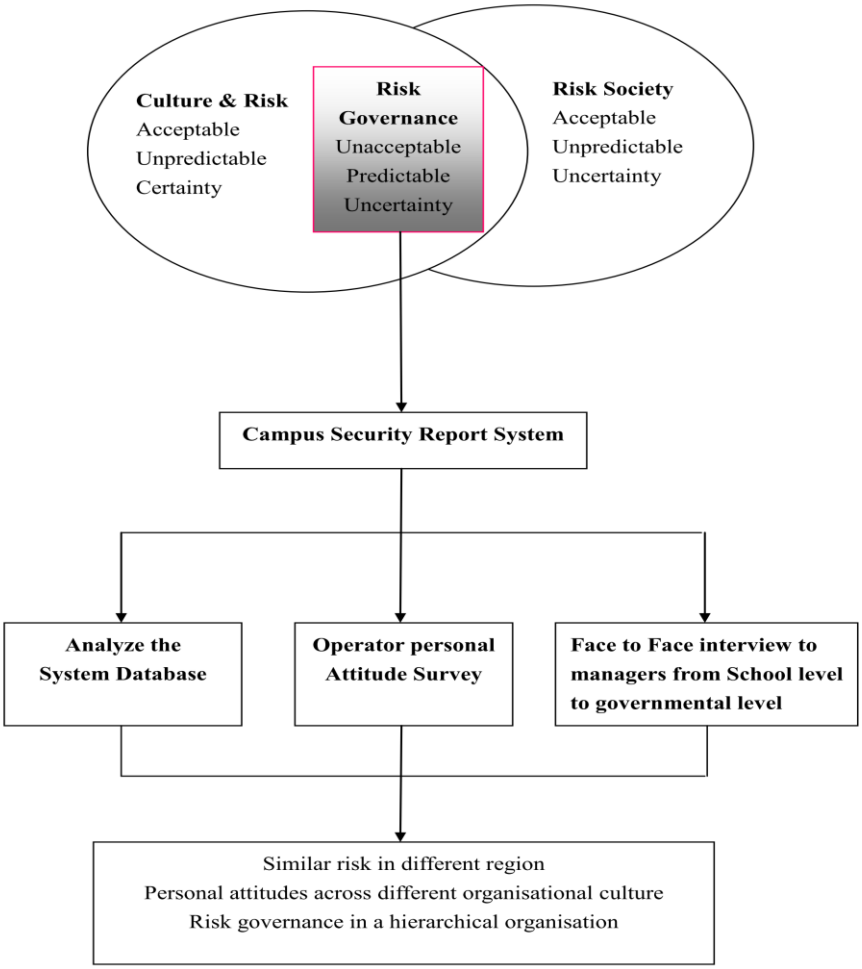
Calendar / Task	2009				2010						2011				
	5-6	7-8	9-10	11-12	1-2	3-4	5-6	7-8	9-10	11-12	1-2	3-4	5-6	7-8	9
Literature Review	*	*	*	*	*	*	*	*	*	*	*	*			
Research Designed	*	*	*	*	*	*	*	*	*						
Fieldwork			*	*	*	*	*	*	*	*					
Transcription work				*	*	*	*	*	*	*					
Data Analysis					*	*	*	*	*	*	*	*			
Writing up the Thesis						*	*	*	*	*	*	*			
First Draft Modified										*	*	*	*		
Thesis Completed												*	*	*	
Printing														*	*

3.10 Conclusion

This chapter has provided a brief account of the background of the research question and design, methods approach and choice, and shows the methods which are used in the thesis. The first part of the case focuses on the reported risk trends by analysing the database produced by the CSRS. The second part of the case is focused on the personal attitudes of the operators of the CSRS within high schools. The third element of the case is concerned with the significant difference on risk governance between the junior staff and the senior managers.

The complexity and variety of the campus security events that appear in the database for different areas will help us understand risks and how they were managed and what lessons this would have in general for developing a more ‘socially robust’ approach to risk management. Therefore, this thesis adopts a mixed methods approach, which involves case study, secondary data analysis, quantitative research, long-term research and interviews to collect and analyse the data from the CSRS and different groups of operators and managers (see Figure 3.4 below). The following chapters describe the details of the CSRS database and the results of the survey.

Figure 3.4 Research design: exploring risk governance in a socio-technical system



Chapter 4: The analyses of the Campus Security Report System in Taiwan

4.1 Introduction

As the previous chapter discussed, risks have accompanied human behaviour and activities from pre-industrial to modern society, and as we saw in Chapter 2, that Beck (1992) claims that people today are living in a 'risk society', one that creates new forms of risk. In everyday life, new types of risk may be particularly associated with the innovation of technology. Car transport is an obvious case in point: according to the World Report on child injury prevention, 'nearly 1.3 million people were killed in road crashes and up to 50 million more were injured or disabled" around the world in 2004 (Peden et al, 2008: 31). At the same time, if risks do not harm society in such an obvious and immediate way, they may not cause citizens concern either. Moreover, risks may be linked to a taboo which acts to suppress attention to them (Douglas 1978). In contrast, Foucault (1978), as we have seen, argues that rather than being hidden, the identification and disciplining of risk is characteristic of the biopolitics of society and a form of power which, while controlling risk, inevitably controls people. Indeed, one of any organisation's or government's main tasks may be to prevent uncertain risks and so protect but also control the citizen and his/her property (Chapman & Ward 2002). This is why writers such as Renn have argued that government or other public or private institutions should explore and seek to understand the dynamics of risk (Renn 2008). In this chapter, I introduce and discuss in some detail the development of a national IT system in Taiwan that was established by government to manage and so 'discipline' risks, initially linked to potential environmental disasters, but subsequently broadened to include a much more extensive risk register.

There is no doubt that in every region or country natural or man-made disasters occur unavoidably because of some regional characteristics related to climate or geographical factors such as flooding or earthquake, as was seen most tragically in the flooding in Pakistan in the summer of 2010. Most citizens pay attention to visible threats rather than invisible risks, because people are more likely to be concerned about the more tangible risks they face and ignore less tangible risks that may well carry major threat. Douglas and Wildavsky (1982: 35) argue that each culture creates its own values through which natural or normal risks are defined in citizens' minds through the socialization process or the expression of a shared subculture. Consequently, Beck (1992c: 2) suggests that

people have responsibility to develop a cooperative strategy within their culture to deal with risks accompanying the development of civilization in the global society. As an example of this process, this chapter examines the development background of the Campus Security Report System (CSRS) in Taiwan, and shows why Taiwan's Education Department established a unique reporting system to manage those emergency events occurring on campuses, according to the "Disaster Prevention and Protection Act" introduced in 2000. I also discuss the procedure through which the managers at governmental department level monitor the various campus security events. Then I will move on to explore the database recorded in the CSRS and the annual report published by the Campus Security Report Centre (CSRC).

My thesis focuses on the operational model and functions of the CSRS and tries to explore some possible or predictable patterns of the events by analysing the historical record carried in the data over a period of time, and *how this might be understood* by those seeking to manage risk. I am mainly interested in providing a description of the system and how it 'works' and how it is constructed, how data are recorded, and indeed what this data shows in broad terms: in this chapter I do not want to deconstruct or challenge the data as such or the process itself; the latter is the task of chapters 5 and 6. The first section below describes the background of how the CSRS was created in response to a series of disasters, particularly with reference to Taiwan's geographic environments. The second section discusses the relationship between the development and design of the CSRS itself. The third section demonstrates the diversity of the campus security events and the creation of a list of risk categories within the CSRS, and also shows how those were involved in operating the system. The fourth section explores the extensive body of data held by the system, data which was generated by the local operators recording events and incidents to the system itself. Finally, the focus will move on to the annual reports, whose purpose is to offer an analysis of some possible trends for risk governance, prepared by the CSRC staff, based on their interpretation of the data.

4.2 Background to the development of the CSRS in Taiwan

There are various reasons or purposes why organizations seek to develop a risk management system. Some relate to handling emergency events; some may be expected to help reduce the severity of damage from potential threats. Those events and threats

may endanger the safety, life or property of citizens or organizations. The Department of Contract and Management Services (CAMS) in Western Australia, for example, was established to provide contracting service to government agencies, and their key role is to manage contract and procurement risks (Baccarini et al 2001: 139). Inevitably, most public regimes may take some degree of responsibility for reducing risk for citizens or societies. Thus, a hierarchical organization may develop or design some strategies, plans or management systems to prevent or to monitor most visible and invisible risks from endangering people or damaging property. Such governance functions may be varied from case to case; some may depend on the internal demand of institutions such as the CAMS task described above, and some may be influenced by the external conditions such as environmental issues or geographical limitations. In the next section, I will interpret how the CSRS was initially developed and established with respect to the management of geographic risks.

4.2.1 The geographical location of Taiwan

Taiwan, also called 'Formosa', is the largest island of the Republic of China (R.O.C) in Eastern Asia located off the southeastern coast of mainland China and the eastern edge of the Pacific Ocean (see Figure 4.2.1). The shape of the island is like a leaf that is narrow at both ends. It is located in the southeastern corner of Eurasia and is separated from the Asian continent by the Taiwan Strait which is located at 23.46'N 121.0'E. The average distance between mainland China and Taiwan is about 200 kilometers. The East Sea is in the north of Taiwan. The distance between Taiwan and the Ryukyu Island, which is the southernmost island of Japan, is about 600 kilometers. And there are 350 kilometers from the northern-most point of the Philippines to the southern-most point of the Taiwan. The territory of Taiwan occupies 35,980 square kilometers (13,892 square miles). It is about a quarter of the size of Britain.

Figure 4.2.1 The geographical location of Taiwan

From a climate science point of view, the Tropic of Cancer spans the south of the Taiwan. This has benefited the whole island which is covered by tropical and subtropical vegetation. However, some drawbacks are caused by such a geographical location. For example, Taiwan is within the path of typhoons created by the tropical storms that blow up in the marine tropical weather areas. From a geological point of view, Taiwan is near the seismic fault of the Pacific Ocean, which has caused some serious damage to the island such as with the "Chi-Chi" (also called '921') earthquake, a 7.3 Richter scale quake on September 21, 1999. Consequently, both typhoons and earthquakes are major natural disasters because they usually cause serious property loss and physical damage for society and people in Taiwan.

In respect to its geographical location, Taiwan is situated in and controls the waterway which governs marine transportation through the Taiwan Strait. As such, the country enjoys a strategic location and pivotal control point in eastern Asian. This was one of the reasons why the Netherlands, Spain and Japan have occupied Taiwan by force in the past (Murray 1998: 5). Otherwise, Taiwan has continued in the shadow of potential force threat after the post World War II, especially the rise power of mainland China (Allen 2000: 7), such as the attack of Dachen Islands in 1954, the attack of Jinmen Island in 1958, and the demonstrations of missile exercise which targeted on the north and south of Taiwan between 1995 and 1996 by the China military threats (Allen 2001: 113-121). In light of this, risk management might be seen to be one of the important issues for the country because it suffers from so many natural disasters or potential man-made (military) threats.

4.2.2 The original establishment of CSRS

As previous section highlighted, the potential threats in Taiwan have never reduced or eliminated from the military forces of the People's Republic of China (PRC) after the government leaded by Kuomintang (KMT) retreated from China continent to the main island of Taiwan. Therefore, most of the government regimes may take part of responsibilities on national security and the organizational culture in government institutions may be more sensitive on risk/emergency management. Allen (2000: 9) points out that "culture has always occupied an important space in the politics of Taiwan's national survival and identity which has rise the possibility of civil society and the changing role of culture in defining national identity". He concluded three phases of

culture policy in Taiwan, including the era of cultural reconstruction between 1945 and 1967, the era of cultural renaissance between 1967 and 1977, and the era of cultural reconstruction from 1977 to the present (ibid 11-12). Otherwise, the cultural renaissance contented three-step process which included public dissemination, moral education and active demonstration. Therefore, the course design not only related to the society and ethics but also contained the responsibility of citizenship and morality at primary and secondly school. Consequently, more courses were introduced at high school such as Chinese culture, military education, natural and social science. Indeed, culture content may be influenced by social changes but it could be impacted by the national security more possible than by other factors. For Taiwan, the threat from PRC military force is extremely obvious; government regimes, therefore, have to pay more attention to risk management task and citizens may take responsibility for national security as well. Such a social circumstance may create a unique sensitive culture such as vigilance and surveillance of potential threats or risks. Schools at that time, consequently, not only were responsible for the education task but also may have to assist the government with the national policy on risk management by teaching military education course, which can explain why military officers serve on campus in Taiwan. Those staff not only provides basic military education and national security concept to students but also have to monitor and deal with the campus security events.

Obviously, in order to reduce loss of property and to prevent the potential threats coming from disasters, governments may develop emergency plans in advance to alleviate the damage, for example, in the USA, the Environment Protection Agency (EPA) was established to support local and state regional government to compare and control potential environmental risks (Morgan et al 2000: 49). Sometimes comparing similar disasters or events that have happened in other countries may be seen as a useful strategy. For example, the Northridge earthquake occurred in California on January 17th, 1994, causing over 60 deaths, more than 5,000 injuries, and over 25,000 people left homeless; the direct economic losses were estimated at about $25 billion (FEMA 2010). Conjecturing that such a huge disaster may happen in Taiwan as well, Taiwan's government convened all the relevant departments which handle potential risk events to make a draft plan for preventing damage caused by natural disasters, called the "Natural Disaster Prevention and Protection Scheme".

On April 26th in the same year, a CI 140 China Airlines plane crashed at Nagoya Airport,

Japan. The Japanese government deployed a standard procedure to manage and deal with this man-made emergency. The government was seen to demonstrate an effective response in its handling of the event. Referencing the crisis management experience from the Nagoya crash, the Taiwanese scheme has been modified again to be more complete and its name changed to the "Disaster Prevention and Protection Scheme". Although such schemes for protecting people and preventing disasters have been implemented, natural disasters continue to cause serious harm to society, such as the typhoon 'Herb' in 1996, the typhoon 'Winnie', the collapse of the Lincoln Building in 1997, and the CI 676 China Airlines crash at the Chiang Kai-shek International Airport in 1998 (Cheng-Hsin 2003: 51).

Moreover, in Taiwan itself, the largest earthquake that has caused the most serious damage on record, as noted above, was the Chi-Chi earthquake in 1999. According to the report from the National Fire Agency in Taiwan, the earthquake caused 2,415 deaths, with an additional 29 missing and 11,305 injured; also, 51,711 houses collapsed and 53,768 houses were damaged, including many classrooms and buildings at schools (National Fire Agency, Ministry of The Interior, 2000). Fortunately, there were no students at school at the time because the earthquake happened during the night. After this major event, on July 19th 2000, a proposed law for controlling emergency disasters was discussed by the Legislative Department and published as an official document, which provided a formal standard for managing disasters, called the "Disaster Prevention and Protection Act" (Laws & Regulations Database of the R.O.C 2010).

According to the "Disaster Prevention and Protection Act", each governmental department should make plans for the prevention and management of disasters. As a result, the Campus Security Report Centre (CSRC) was established by the Ministry of Education R.O.C. The responsibility of the centre is to integrate information about disasters, supply the resources and manage emergency events which happen at schools (CSRC 2010). In order to handle the various and unpredictable events across multiple schools, the CSRC developed a management system in July, 2001, called the "Campus Security Report System" (CSRS). It supports the managers at the CSRC to manage all the campus emergency events that are reported by local system operators at schools.

4.3 The structure of management at the CSRS

There are a number of good reasons to choose the CSRS as the subject of my case study.

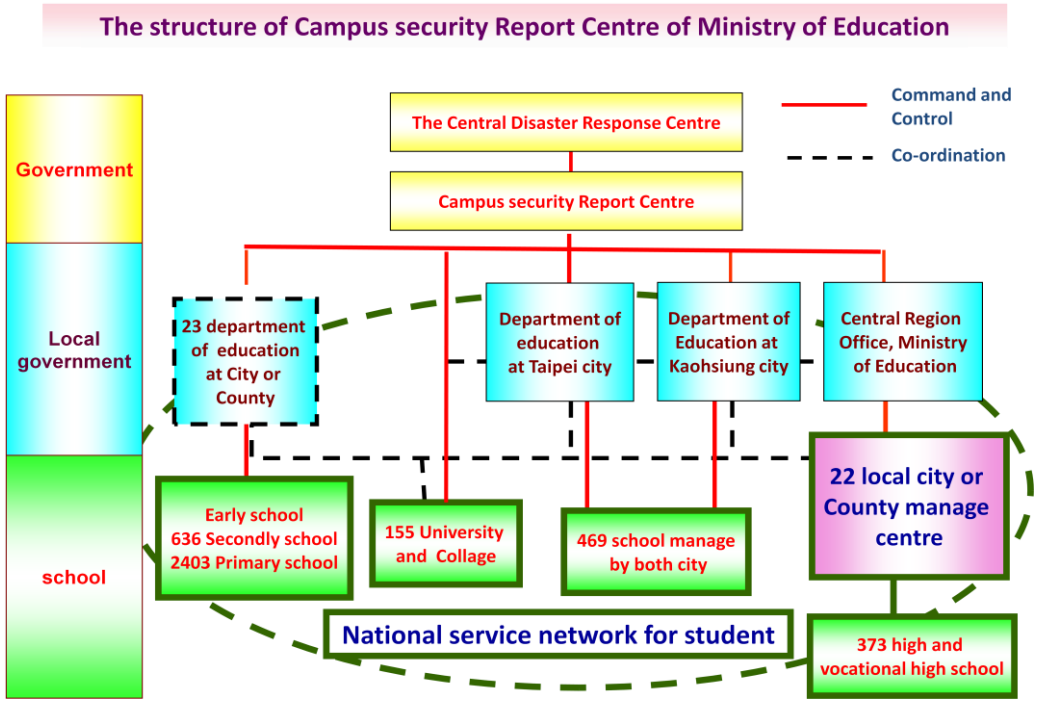
Florig et al (2001:915) point out that there are some advantages to studying risks within the school setting. Firstly, most people know and care about risks in school: risk culture is school reflect the heightened sensitively dealing with minors as a "vulnerable" social group. Secondly, a wide range of risks are involved in school security events, such as physical, chemical, biological, and social risks. Third, risks are typically sorted into a manageably small number of categories, such as asbestos related, infectious diseases and school bus accidents. Finally, in light of the above, risk events may be recorded promptly and effectively. In this section, I introduce the management structure and the operational functions of the CSRS.

4.3.1 The structure of the CSRS

The establishment of the CSRS was based on the "Disaster Prevention and Protection Act". According to the Act, the Central Disaster Response Centre (CDRC) was established as the command centre which controls and manages every disaster at the national level (see Figure 4.3.1 which shows in bold the lines of co-ordination across the different levels of the system). The responsibility of the CSRC is to monitor and report any emergency events within the educational system. The major function of the CSRS is to handle each security event on campus, including both man-made and natural disasters, around the country immediately, from primary schools to universities. It provides a platform to monitor unpredictable accidents and uncontrollable disease events for the government (CSRC 2003).

A second management level is provided by local government located at the middle of the command structure. There are Departments of Education at twenty-three cities or counties, two municipality cities (Taipei and Kaohsiung), and the Centre Regional Office, which is under the jurisdiction of the Ministry of Education. Schools themselves are the third tier of the system. There are 636 secondary schools and 2,403 primary schools governed by the twenty-three cities and counties, 155 universities or colleges governed by the CSRC directly, 469 schools (includes high school, secondly school and primary school) managed by Taipei and Kaohsiung cities, and 373 high schools and vocational high schools governed by the twenty-two local cities or counties management centres.

Figure 4.3.1 The structure of Campus Security Report System



Source: Campus Security Report Centre (2009) http://140.111.1.166/csrc/

4.3.2 The management and operational model of the CSRS

As methodology chapter described, the CSRS was devised as a result of a directive from the Ministry of Education. According to the directive, each school, including private and public schools, ought to establish a central place for school managers to control and deal with campus security events. If any event injures students or staff, or damages facilities at a campus, a school's manager should report the details of the event to the CSRC through the IT network.

In Taiwan, each school has an individual account number and confidential code provided by the CSRC as an authorization for school managers to login to the CSRS (See Figure 4.3.2). Users will find some multi-functions after logging on to the CSRS web-page. Firstly, the school managers not only report the campus security events through the system but also may download some standard procedures or acts in regard to the emergency event or disaster prevention. Secondly, the web page may show some breaking news or information for users, which provides timely information for cities/counties or school managers. If an emergency event or natural disaster causes a threat to local schools, for example, the CSRC may give direction or guidance to school

risk managers through the system immediately. Third, the system also provides a practice and training page for users who might have never used or operated the system before to understand the correct procedures and regulations before they use this system. Finally, the annual reports about campus security events prepared by the CSRC provide a basic analysis of the events, some recommendations and suggestions on how to prevent the events and the policies that management within schools, local cities/counties managers should adopt. I will discuss these reports towards the end of this Chapter.

Figure 4.3.2 The Campus Security Report System web-page 1

Source: CSRC (2010) http://csrc.edu.tw/

In reporting a particular incident, after logging in to the system, school managers are required to provide some details about the event. The system will automatically show the reporting time, school name and location, which have already been set up in the system, and gives a sequence number at the top of the form. Then the person who makes the report should sign in his/her name and contact telephone number for the CSRC manager to collect the information rapidly. After that, some basic information of the event, including the event category, happening and reporting time, the current location of the client, the number of people involved, and the location of event, should be filed to complete the report.

At the same time the reporter should provide some details of the person(s) involved, such as their gender, name, age, identity, severity scores, department and current location. However, if an event relates to damage/loss of the facility/property, the

reporter will be asked to describe the situation and the quantity of damaged property, and to estimate the amount of money lost in this event. Following this is the summary of the event which shows the causes and processes of event. The description of the event gives the outline in sequence of chronological order, which shows a clear correlation of the event, and some review and suggestions for improvement in managing the risk may be provided in this part for future reference. Finally, the reporting information is printed out in the campus security form and sent to the head of unit and the Principal at the school when the reporting procedure is finished. It may also be sent to the director of the CSRC at the Ministry of Education at the same time if the event has caused serious injury to the student/staff or damage to the property/facility on/off campus (See Figure 4.3.3).

Figure 4.3.3 Sample of the campus security event report form

教育部校園安全暨災害防救通報處理中心

Campus Security Report Center

Reporting time:11:40:10 19/05/2010 Event S/N: 25XXX1 City: Taichung City

Name of School: University of OOO Reporter: Peter Huang Contact Tel: 04-2237XXX0

Campus Security Event Report form

Main Category	Sub Category	Sub sub-category	Level	Number of Deaths	Number Injured	Number hospitalised	Other
Accident	Traffic Event	Off-campus Traffic event	C	0	1	0	0

Time of the event	Time of getting report	Event Location	Any other schools involved
10:00:00 18/05/2010	21:30:00 18/05/2010	Still checking	No

Information of the Client

Gender	Name	Severity scores	Identity	Status of student	Category of school	Age	Department	Current Location	Did it happen to him/her before	Note
Male	OOO	Serious Injury	Student	general	University	21	Sociology	Hospital	No	

Loss of property

Severity scores	Name of property	Property	Unit	Quantity	The amount of money	Insurance
Semi-destroyed	Motorcycle	Vehicle	Cars	1	10,000	no

Summary of Event：	At 10:00:00 AM 18/05/2010, Student XXX at XXX school had an off-campus traffic accident.
The causes and processes of the event (Outlined in chronological order)	1. At 21：20, a tutor XXX reported that a second-grade student XXX at the XXX Department is at the ICU in the city hospital now. 2. At 21：22, The duty personnel called the city hospital to determine the latest situation of the student, but the hospital refused to answer this inquiry to protect the patient's privacy because they could not confirm the identity of the person who was calling via telephone. 3At 21：25, the duty personnel reported the event to the director of CSRC (University), the department supervisor and tutor of the student. The director instructed the duty personnel to visit the student and his families in the hospital and to help with the leave procedure and the application of student insurance. 4. At 22：20, the duty personnel and the student's tutor visited the student in hospital and understood the student's injury situation and the causes of the accident. According to the student's parents, the student hit a traffic island for dodging the coming car on his way to deliver goods. He got bruises and contusion on the legs and upper body, laceration on the chin, and intracranial hemorrhage and concussion. The student still got clear consciousness but had to stay in the hospital for the observation of the need of surgical operation. 5. At 22：30, the duty personnel reported the condition to the director of CSRC (University), and provided the student's parents some details about how to apply for student insurance and emergency assistance. 6.At 23：30, the duty personnel returned to office for his duty and informed related departments on this event.
Treat situation：	
Review and improving suggestion：	1. This accident was caused by speeding while driving. 2. Arrange a course in traffic safety training to improve awareness of traffic security and safety education for students and staff. 3. Provide safe-driving courses for students who ride motorcycles.

Contractors	Head of Unit	Principal

The suggestion of the Ministry of Education	Countersigned	View by the educational department
Records for future reference XXX		

Source: Campus Security Report System http://csrc.edu.tw/

Thus, through this system, every event happening at schools around the country is not only handled by school managers but also reported to and monitored by the local government and the CSRC at national level. And the recorded data are lodged in the management system at schools, in the CSRC and in the Department of Education (local government) which governs the schools in the city or county (see Figure 4.3.4). Those managers in the same hierarchical system can also share the information about an event at the same time.

Figure 4.3.4 The campus security event report web-page 2

Source: CSRC (2009) http://140.111.1.166/csrc/

4.4 The category and level of the CSRS

The CSRS provides a communication channel among local schools, local educational governing departments and the CSRC at government level, which helps transfer the particular emergency event information from a scene in the local area to central government. However, the reported content of events may vary when provided by persons who make it without reference to standard operating procedures or categories. Because the scope, level and personal or social attitude to risks were seen to depend on people's viewpoints and understandings of what might be regarded as acceptable risk (Douglas and Wildavsky 1982: 81), the CSRC has developed a reference standard for managers to reduce the variations in report content. Here I go on to explain this

standardizing process and discuss the categories of risk reporting that it has generated.

4.4.1 The category of the campus security event

Bearing the above in mind, managers are the key persons responsible for reporting the event at each school, because their statement covers the main features of the event. Therefore, the content of the report made by the manager is quite crucial. The more clearly a reporter describes the events, the more accurately a local or centre manager can monitor them. Since the concept of risk varies from person to person, there is no value-free way to classify risky phenomena when people manage risks (Morganger et al 2000: 52). Moreover, the reporter could not judge the event from their personal points of view because any judgment may cause confusion for a system manager when they evaluate the influence of the event.

In order to enhance the efficiency of reporting, the CSRS has devised the reporting content according to some key, standardised items: client, problem, time, location and the category of the event. When system managers at the CSRC receive the campus security event report from local school managers, they may give some feedback or notes on dealing with the event. However, how local managers decide what kind of events they should report to the CSRC, how reporters distinguish the levels of event and what kinds of the regulations may help managers to operate the system are clearly not straightforward matters. Indeed, a systematic way to compare and rank such risk reporting by operators is unfeasible; therefore, the risk management agencies have taken on the responsibility to classify the thousands of specific risk events (ibid 49). Florig *et al* (2001: 915) point out that categories for school risks might be based on the agent responsible for the harm, the activity that produces the hazard, the location, the pathway, the reason for the risk, the group at risk, the respondent for creating the risk, or the entity who is responsible for managing the risk. In light of these considerations, Florig created twenty-two categories for school risk ranking.

In a similar fashion, according to the CSRC (2001), any events which may affect the management or government of the administration work or threaten students' safety on/off campus are regarded as campus 'security' events. Those events were classified into five main categories and forty sub-categories in the CSRS from 2000 to 2003 (see Table 4.4.1). The main categories included the 'accident' event, 'security related' event, 'violence and deviant behavior', 'counseling conflict' event and 'illegal' events

involving children and teenagers. Each item also involved various sub-categories. Firstly, the accident events included traffic accident on/off campus, drowning, poisoning, injury received during laboratory or practical training, disease, suicide or a self-harm event, mountain accidents, damage caused by strong wind, earthquake and others. Secondly, the security-related events comprised fire on campus, a campus security event, harassment or theft and disputes event within rented accommodation. Third, violence and deviant behavior events referred to fighting, murder, robbery, kidnapping, threat, trespass, sexual harassment and acts against the "Drugs Prevention and Cure Law" etc. Counseling related events, included incidents of conflict between students and teachers, parents and teacher/staff, and staff and staff, punishment or abuse events, student protest and other related events. Finally, illegal events involved incidents of running away from home (for more than three days) and abuse, and other illegal events against children's welfare legislation. It is worth noting that the 'client' who is involved in this last category is less than eighteen years old.

Table 4.4.1 The main and sub-categories list in the CSRS from 2000 to 2003

Main - categories	I. Accident Event	II. Security-related Event	III. Violence & Deviant Behavior	IV. Counseling Conflict Event	V. Illegal Event involving Children & Teenagers (Under 18)
Sub categories	1.Traffic accident in and out of the campus 2. Drowning event 3 Poisoning 4. Injury received during laboratory or practical training 5. Disease 6. A suicide or self-harm event 7. Mountain accident 8..Strong wind 9. Earthquake 10. Other	1. A fire on campus 2. A campus security event 3.A harassment event on campus 4. A theft on campus 5 A dispute event within a rented house	1. Fighting 2. Murder 2. Involved in a robbery 3. Involved in kidnapping 4. Threat against the person 5. Trespass 6. Sexual harassment 7. Illegal possession of firearms 8. Against the drugs prevention and cure law 9. Fighting event 10. Hindering freedom 11.Involved in disturbing social order 12. Involved in theft 13. Sexual assault or obscene behaviour. 14. Involved in gambling event 15. A swindle event 16. Extortion 17. Other	1. A conflict event between student and teacher. 2. A punishment or abuse event. 3. A protest event from student. 4. A conflict event between parent and teacher (staff). 5. A conflict event between staff and staff. 6. The other related conflict event.	1. Run away from home (more than three days) 2. An abuse event 3. Other illegal event 4. Against the child welfare law

However, after being used for several years, the categories in the CSRS were found not complete enough to cover all the events occurring on campus and needed to be modified. Therefore, a modified classification was established in 2004 (see Table 4.4.2). Two main categories and forty-seven sub-categories were added to the original classification. The first new main category was "natural disaster", which through existing from the start was separated out from the category of 'accident event' to cover multiple disaster events,

including windstorm disaster, flood, landslip and mudflows and the presence of *Solenopsis invicta Buren* (a particularly aggressive and dangerous red ant). The second new category was "other", which provided a flexible open-text space for operators, involving most conflict events between staff and students, and some administrative problem. Morgan *et al*. suggest that "agencies or organizations conducting risk-ranking projects would be well-advised to develop several alternative categorizations". They believe the availability of several alternative categorizations may encourage the operator to adopt a broad systematic thinking concerning what is important about the risks and how they should be categorized and ranked (Morgan et al 2000: 57).

Table 4.4.2 The Modification of the Sub-categories in the CSRS from 2003 to 2008

Accident event	Security related event	Violence & Deviant Behaviour	Counseling Conflict Event	Illegal Event involving Children & Teenagers (Under 18)	Natural Disasters (2004)	Other (2004)	Diseases (2005)
(2004) • Poisoning. • Injured from re-establishment. • Injured by building collapse. • Injured from part-time work place. (2005) • Chemical material in laboratory causing poisoning. (2007) • Suicide with child. • Student suicide or self-harm. • Staff suicide or self-harm.	(2004) • A fire outside of campus. • Facilities destroyed by someone on campus. • An explosion on the campus. • A dispute event from bargains. • People from outside to pose risk to teachers and students. • Campus facilities or equipment lost through theft. • The property loss by theft. • Swindling • Injury • Robbery • A threaten and extort event. • Suspect be kidnap. • The other violent event. • Sexual assault or obscene behaviour (over 18). • Sexual harassment (over 18). • Other campus security-related event. (2005) • A dispute event from internet. • A hacker to invade the school network system. • Staff swindle by the network.	(2004) • Illegal car racing. • Suspect involved in sex business. • Suspect involved to arson and to destroy. • A faction to intervene the campus. • Run-away from home and did not go to school (under senior high school). (2005) • Student disorder during a ceremonial event. • Student harassing teaching. • Group of students cheating. • An internet-based swindle • Hacking • Suspect involved to hinder families.	(2004) • A resist event from student.	(2004) • Student to drift. • Student in to the illegitimate place. • The other children and teenager protect case. • Adult to compel children or teenager to marry. • Illegal to utilize children or teenager. • Kidnap or sell children or teenager. • To force children or teenager by sexual assault or indecent attitude. • To use harmful drug or illegal medical for children and teenager. • Children and teenager suspect involved the sex business. • The other against Child and Youth Sexual Transaction Prevention Act. • Sexual assault or obscene (under 18) (2004) • Sex harassment (under 18). (2005) • To take or provide noxious tapes or books for children and teenager. • Sexual assault causes pregnancy (under 18). • High risk family.	(2004) • Windstorm disaster • Flood • Landslip and mudflows • Solenopsis ivicta Buren (2005) • Eearthquake • To be struck by lightning. • The other disaster.	(2004) • A conflict even between staff and staff. • A problem of personnel matters. • A problem of general. administration • The other problem. • A problem of educational administration. (2005) • A problem of administration.	(2005) • A generally disease event • Statutory disease (Swinepox) • The other statutory disease • Statutory disease (Scarlet fever) • Statutory disease (Dengue fever) • Statutory disease (Tuberculosis) • Statutory disease (Enterovirus) (2007) • Statutory disease (Pertussis) • Statutory disease (SARS) • A generally disease event (Ophthalmia) (2008) • Statutory disease (Swine flu cause severe illness). • Statutory disease (flu cause severe illness). • A generally disease (flu). • A generally disease (H1N1).

Some other minor changes were made in 2005. One main category and twenty-four sub-categories were added into the classification. ‘Disease’ was separated from the accident-related category and extended the scope of disease risk to include general and some statutory diseases such as Swinepox, Scarlet fever, Dengue fever, Tuberculosis and Enterovirus. Also, some sub-categories were added into other main categories. For instance, the poisoning event caused by chemical material in the laboratory was one of sub-category of the accident event, and some dispute events were relocated into the security-related category, such as online trading risks and incidents of computer hacking.

Elsewhere, some events regarding to student conduct have entered the violence and deviant behaviour category, including harassment caused by students in a ‘ceremony’ or in class, cheating by groups of students, swindling or hacking events through the internet and other suspicious activity. Furthermore, some new types of event have appeared in the ‘illegal’ category which involve children and teenagers, such as, giving or providing noxious tapes or books for children and teenagers, pregnancy caused by sexual assault and the ‘high risk family’, which may imperil children because of their parent’s mental or physical problems. Finally, three disaster items were added into the natural disasters category, such as earthquakes and lightning strikes. After the modification of the classification in the CSRS, the event list was regarded as containing most of the likely forms of risk that need to be addressed by campus security staff. There were eight main categories and one hundred and nineteen sub-categories on the CSRS list in 2008 (See Appendix VIII).

However, yet another more recent modification of the CSRS was implemented in February 2010, which combined similar items together and redefined the application of some existing sub-categories with actual behaviour. The biggest modification was that each main category was not only broken-down into sub-categories but also the latter were given more detailed description. Therefore, the function of sub-sub-categories is to provide more clear classification and guidance for operators. Morgan et al (2000: 54) note that “creating lists of the subcategories, and even sub-sub-categories, can be helpful in assuring that inclusion and exactness criteria are satisfied”. The eight main categories of events then were broken down into more subcategories, arriving at one hundred and twenty-one items (See Appendix IX), which, given what we have seen so far, may be modified by the CSRC when it is seen to be needed in the future.

What we see then is a highly complex risk-reporting system that has grown with time, sought to standardize and refine the range of categories it covers, and done so in such a way as to apparently limit the interpretative work that the reporting manager is asked to do. Moreover, the risks reflect changing social concerns in Taiwan at a national level, notably anxiety over new forms of disease and the impact of new technologies, such as hacking on the internet; so, as Beck argues, technologies provide some function for risk management, but they also may be the source of new risks. In addition, the actual technical functionality of the system has been expanded and interpreted across the different reporting levels.

As the system has developed, the redefinition of risk events, for example, the relocation of online risks from the "dispute" to the "security" category reveals not only a "tidying-up" process but also a changing cultural judgment about risk-events and the sort of responses they require, and the categories within which they fall. Moreover, increasing the levels of severity also reflects forms of cultural judgment, which as Douglas would argues, reflect levels of risk in a form of 'solidarity' which, as I argued in Chapter 2, appears to be strongly hierarchical. Indeed, the conceptual logic and architecture of the system is itself ordered in hierarchical terms, the organization having to create its own culture in conformity with external circumstances and pressures. Such phenomena may also explain why the CSRC has to control and to monitor a large number of events which contain both man-made and natural disasters. The modification of regulations and categories were made to improve the system function, suggesting some flexibility of system. It may be interesting to understand the actual causes of these modifications. I will try to explore such phenomena in later chapters. I now go on to discuss how this ordering is reflected in the various degrees of 'severity' that define the relative threat posed by specific types of risk in the schools/colleges.

4.4.2 The diversity of campus security events

The previous section discussed the eight main categories of the campus security events and described the sub-categories which are subdivided from the main categories. This section tries to explain the different degrees of severity associated with events, graded in particular in terms of the level of injury to student or staff and the loss of property to the campus facility. Such events not only caused harm to people but also created damage to campus facilities. Therefore, they were classified into personal risk and property risk.

According to the CSRC (2003), the system for reporting security events is divided into three degrees of severity: A, B and C (see Table 4.4.3). The first degree is "A" level, which relates to three factors. The three criteria are as follows: does the event cause death or is it concerned with death; does it refer to a property loss of over NT $1,000,000; finally, does the event prompt significant media interest and would its handling need some support or intervention from government. If any A-level event happens according to one or more of these criteria, the school managers are required to contact the CSRC by telephone within fifteen minutes. After collecting more detail about such an event, the school manager ought to report the latest information and complete the operational procedures within two hours. If there is any trouble with the internet reporting system, the procedure may be replaced by use of a fax. After the functioning of the internet is restored the manager should repeat the procedure again through the system itself.

The second level of an event is classified as having a "B" level degree of seriousness. The actual events categorised at this level may be similar to those allocated an "A" level grading. The standard point also focuses on three factors but the seriousness is slighter than the level above. Any event classified at this level may cause heavy injury for the victim or make a property loss of a facility of between over NT $100,000 and under NT $1,000,000. In addition, anything not categorized into A level and that cannot be handled immediately may be grouped into this level. If a B-level event happens, the school managers should report to the CSRC within twelve hours. The alternative measure is the same as that of the "A" level.

Finally, the lowest degree is "C" level. Any event causing slight injury for a student or staff or leading to a property loss under NT $100,000 dollars is categorised as C level and has to be reported to the CSRC within fourteen days. Obviously, most of the C-level events just cause minor injury for students or staff and are likely to involve only a slight loss of property on a campus. Such results may cause some school managers to ignore the events' growth rate at this level; however, the C-level events may still generate enormous personal problems to students and staff on campuses.

Table 4.4.3 The diversity of the campus security events list

Condition / Level	Harm to the person	Loss of Property	Time to report	Note
A	The event causes a victim's death or is life-threatening.	The property loss is over NT 1,000,000.	Report within 15 minutes with telephone or fax and within 2 hours online.	The event needs help from government or other agency and may cause media or societal concern
B	The event causes the victim serious injury.	The property loss is between NT 100,000 and under NT 1,000,000.	Report within 12 hours online or with telephone or fax.	Other event not reaching A level and cannot be handled immediately
C	The event causes the victim slight injury or ill health.	The property loss is under NT 100,000.	Report within 14 days.	

Source: CSRC (2009) http://csrc.edu.tw/Main.mvc/IndexTemp

Multiple and numerous campus security events have been recorded in the CSRS by the staff at schools with the help of such regulations and operational guidelines. In addition to demonstrating the actual operation of the system, some illustrative examples are presented as follows, drawn from cases of laboratory accidents and poisoning, which show the details of the governance process in practice. The cases were selected from the CSRS system and translated into English directly from the original contents to provide more clear sketches. According to research ethics provisions, all the names relating to clients or schools have been deleted and been replaced by OOO or XXX.

Accident category; Sub-category: Laboratory accident

Case A: a B-level event in a university laboratory

1. At 10:30 AM on 11 June 2004, the health centre received a report that a first-grade student OOO at the department of Mechanical Engineering scalded her face due to an exploration caused by the process of heat treatment.
2. A school nurse arrived at the laboratory to help with the emergency treatment immediately and called 119 to help transport the student to OOO hospital. The duty personnel arrived at the hospital to provide follow-up assistance. According to the doctor, there is a third-degree scald on the student's face, and the accident also caused the ablepsia on her right eye. Now she is still under treatment.

Case B: a B-level event in a secondly school chemistry laboratory

1. At 16:15 PM on 25 June 2004, a science teacher made sodium hydroxide solution for students at a laboratory. Student OOO put down the sodium hydroxide solution on the table so hard that the mixtures spilled out and scalded one of his eyes.

2. Teacher OOO cleaned the student's face with clean water immediately and asked the health centre to call 119. The student was delivered to the OOO hospital at 16:25 PM, accompanied by a school nurse, and his parents were notified at the same time.
3. Because of the serious injury, the student was referred to XXX hospital.

Case C: a B-level event in a high school's cooperative education factory

1. On 12 January 2008, a second grade student OOO who studies at the Automotive Repair Division fractured his left arm with a lathe by accident while he was moving goods at the cooperative education factory.
2. The student was sent to the XXX hospital immediately for an operation; and he is hospitalized now.

Case D: a C-level event in a university chemistry laboratory

At 15:30 on 23 July 2008, teacher OOO's upper lip was injured and two of his incisors were broken in a gas explosion when doing physics teaching research with teacher XXX in the laboratory. He was sent to XXX hospital for treatment. According to the doctor, the client's situation is stable and an operation for dental implants is in progress now.

Accident category; sub-category: Poisoning

Case E: a B-level event - a university student group poisoned during a trip

1. Fifty-two third-grade students at the medical department traveled to the OO national Park and XX amusement park on the 8th and the 9th January 2003.
2. The students had breakfast at the XX amusement park and lunch at the AA restaurant in the OO national park.
3. Students felt uncomfortable one after another on 9 January evening, and the number reached twenty by 06:00 PM on 10 January. Eleven of them went to see doctors by themselves and went back to school/home.
4. The district health centre received a report of this event from OOO clinic and undertook a collection of specimens.

Case F: an A-level event of a group poisoning in a normal practical training class at a high school

1. At 12:30PM on 16 June 2008, second-year student OOO vomited and had a stomach ache after the home economics class. Another seven students had similar symptoms around 13:00.
2. The school health center took charge of the event and asked for an ambulance to send

the students to hospital.

Case G: an A-level event involving group poisoning in a class at a secondary school
On 16 June 2008, a grade one class had a comprehension class for the first and second classes. Students were separated into four groups, making popcorn with coal, branches, leaves and newspaper. Those cooking materials were bought from A, B, C, D and E supermarkets and were manufactured by X, Y and Z factories. Students ate the popcorn they made accompanied by coke and some soft drinks. Some students felt dizzy, had stomach ache, were sick and had cold sweats one after another around 11:15. After being sent to the hospital and being treated, the students were in a stable condition and recovering.

These narratives give a brief snapshot of real reports that were logged on to the system, illustrative of the different degrees of risk as seen by the managers according to perceived degrees of seriousness. At a more general level, what I have described so far is a national system that is designed to capture/report and require local or wider action through a variety of different actors located within the system. The system is one that has been refined over time in response to changing circumstances. I now go on to explore at a finer level of detail what actual events have been lodged on the system over time, and how the risk management centre (CSRC) provided reviews and recommendations of risk-related incidents within the system to schools/universities in Taiwan.

4.5 The Annual Report of the CSRS

The multiple security events that have happened at campuses around the country demonstrate some diverse risk patterns, with differing attributions of seriousness. The recorded data may be regarded as information on the basic trends or causes of events for the staff and managers, to enable them to avoid potential future risk-laden events. It is not therefore surprising that the CSRC has provided some recommendations and reviews to schools, city managers and the governmental managers by publishing “the annual statistics and analysis report of the campus security events” which can be found on the CSRC web-page. In this section, the discussion focuses on annual reports which were published over five years, between 2004 and 2008. What I want to do is to treat these reports in terms of the common themes and issues they include rather than covering them on a year-by-year basis.

In this first part of the exploration of annual reports I will focus on the school level. Generally speaking, most of the reviews and recommendations provide a rough sketch of risks to schools and local city/county managers. Those suggestions highlight some common events and general problems for all levels of schools. For example, some cases with a high-proportion or frequency of events, including injury from sport or hobbies, disease, or a punishment or abuse event, are more prevalent among students at primary school level (CSRC 2004, 2005). Therefore, the suggestions made to primary schools demand that every school examine the campus facility safety process in order to reduce tangible threats or to improve the campus order to reduce some possible or invisible harm to children in their leisure time and alleviate some potential threats on campus. Consequently, suggestions include requests to schools to enhance the communication with parents to avoid children going to school with an illness as the disease risk has the highest rate at primary school. This may prevent the interactive transmission of the disease on campus but such conversations depend on the relationship between rights and obligations between parents and school. Furthermore, the review not only suggests a discourse between school staff and students' parents but has also advised schools about improving teacher's 'emotional intelligence' management, which may be an effective way to reduce the extent of 'counseling conflict' events. It may be found that most of the reviews relating to primary schools focused on the dialogue between school managers and teachers, which showed that students play passive roles in the process of dealing with such events because of a perceived incapacity they have in regard to self-management.

Compared with primary schools, there are more comments about secondary schools in the reports, reflecting the greater diversity of events occurring at this level of school. Broadly speaking, secondary schools have a similar percentage in both 'the injury from sport or hobby' and 'disease' events with primary schools; the various events causing harm to students, including traffic accident, fighting, intimidation, counseling conflict event between teacher and student, are regarded as being subject to the internal regulation and discipline management on the campus itself. However, two special events were notable in relation to national laws: events about 'suspected behaviour against the drug prevention and cure law', and 'illegal event involving children and teenagers under eighteen' (CSRC 2004, 2005), both events are not only managed at the school but also governed by the educational regimes at the governmental level. Such events showed that students have changed the roles they play in the framing of risk from

being passive to active and from victims to perpetrators. Therefore, the review suggests the educators at secondary schools have to pay more attention to educating students in self-defense and developing the students' safety awareness. For instance, the fact that 'traffic accident' got the highest percentage showed the schools should improve traffic safety training and education. Also, the enhancement of self-defense education not only provides information on self-property protection and management but also promotes awareness of the "Preventing Adolescent Drug Abuse Act" and "Regulation of Child and Adolescent Welfare Act". Moreover, in order to reduce the students' pecceived deviant behaviour, schools may try to segregate students to avoid the possibility of imitated behaviours. However, while this is seen as a way of alleviating the imitated behaviour between student and their peer group, also adult behaviour from the local community has gradually affected the school circumstance. This means managers not only have to prevent some potential deviant behaviour on campus but also need to monitor what are seen as invisible threats surrounding the school.

Not surprisingly, the more activities a student takes part in, the more events may arise on campus, which can be easily shown in high schools. According to the CSRC annual reports (2004, 2005, 2007, 2008), many of the most frequently occurring events which happened in high schools were similar to those founds in the secondary school such as accident and violence and deviant behaviour events. However, the diversity of events are much greater compared with those at the secondary school. For example, most of the traffic events were caused by motorcycle accidents at high school level because some students use motorcycles as the transportation to school. In addition, injury from sport or hobbies may be caused by the fact of more multiple activities at more senior schools. Furthermore, some events relating to personal deviant behaviour found in high schools also have increased significantly if compared with those in secondary school, such as fighting, threatening behaviour, swindling or other violence-related events, which were often seen to be caused by impulsive behaviour among teenagers. Furthermore, it is important to notice that both 'the gang violence event on campus' and 'running away from home event' increased remarkably over the five years. Generally speaking, 'the gang violence event' may be influenced by some predictable factors such as peer group pressure or imitation of adult behaviour. Whereas, 'running away from home events' were sometimes caused by some unpredictable factors such as contact with friends on the internet. Consequently, schools are advised to provide not only general knowledge

for students to help them with self-protection but also organize some interpersonal relationship courses for them to reduce such events.

Finally, some high-frequency ‘A’ events are reported to have caused serious harm to students at university, such as ‘traffic accident’, ‘suicide’ or ‘self-harm event’, ‘disputes associated with rented accommodation’ and those linked to financial problems. The traffic accident was the highest percentage of event causing injury to students at university. Such events occurred outside the campus. According to the statistical information, although the total number of students gradually decreased year by year, traffic-related events remained in a high proportion and caused serious problem to students. This phenomenon shows that such events may be difficult to manage by relying on a university’s own power to prevent the traffic accident because most of the events happened in the wider community. Therefore, some strategies which needed to be implemented across the educational and wider regulatory regimes have been proposed by the CSRC. Those schemes recommended to the university not only suggest the need to provide information about the high accident rate locations for student but also to connect the city/county police power to restrict dangerous driving. By doing so, it may improve the road safety around the campus. However, some events, for example, the ‘suicide’ or ‘self-harm event’ may be caused because of the student’s personality or influence of interpersonal relationships with partners, peer group stress, and the pressure of learning at university. Otherwise, it is worth noticing that many dispute events were caused by business actions such as rental disputes due to the lack of experience in signing contracts, or lack of understanding about internet scams. The reports argue that these events showed that in addition to academic knowledge, university education also has an obligation to students to improve their ability in wider forms of social learning.

The discussion above pointed out some general recommendations according to the CSRC annual report reviews, which discuss some main events and so risks characteristic of and problems at different levels of school. Such reviews were integrated and analysed by the CSRC, at the national level. From Foucault’s point of view, the power of the state lies not only in its control of resources but its discursive power. The governmental regimes which govern or manage risky events see this power embodied in policy and practice, expressed within powerful documents. The huge recorded data in the CSRS may be a good example of this because it is very difficult for a school to design or to develop such a system to manage the complex risks associated

with campus events. Whether the Annual Reports actually work in this way – as important expressions of power shaping behavior expressed as policy implementation - will be discussed later in the thesis. In a hierarchical organisational culture these documents may play a more symbolic role in confirming and acting as a medium through which a bureaucratic structure operates.

From the rather different perspective of Douglas, schools located in different cities/counties may be influenced by local culture or regional characteristics, and local culture may generate behaviour which may not be regarded as risk-related. For example, a 'gang violence' event on campus may be caused by some people living in local community, and may be interpreted narrowly from a governmental manager's point of view in understanding the actual situation as in need of formal report and control, whereas the regional residents may be the most appropriate people who understand the dynamic of local culture: local people may ignore such apparent threats, if such potential risks are considered as acceptable or as usual for local cultures.

From Beck's point of view, some new events, which accompanied the innovation of technology, have appeared and are seen to have caused some visible harms or invisible threats to students in this "risk society". On the one hand new technologies improved the management function on campus events and integrated a large volume of risk-related data through the operation of the CSRS; on the other hand, they themselves may be the causes of potential threats. For example, the reason why students run away from home may be the influence of their peer group or some new friends they made through the internet. It can be predicted that more and more campus security events may be caused by the technology with the increasing use of computers and other digital devices in the future. Beck would also say that the CSRS itself creates risk events through the very categories it has produced and extended over the years through which behavior is then labeled as risk-related. The following discussion will move onto the recommendations made to managers made in CSRS Annual Reports, which provide some possible governance function inasmuch as they are made in order to prevent the events on campus.

Different levels of school may be offered distinct methods to govern the risk events which are seen to depend on the ability of managers to cope with risk. Some common suggestions for schools and local managers were presented in the annual reports (CSRC

2004, 2005, 2006 2007, 2008). Firstly, schools may improve the implementation of campus security reporting, which means that all events should be reported as clearly and fully as possible. Secondly, schools may build better practice through standardising security reporting. Third, schools may improve the emergency event management through upgrading their process ability, from the level of dealing with events to the level of reducing the disaster and preparedness, to promote the prevention function and to reduce some potential events. Fourth, schools may organize some workshops which focused on the campus security events to improve the manager's ability in handling the emergency events and to reduce the event rate through the study of cases that have happened in the past. Fifth, schools may establish a support network which connects the school and community to integrate the social resources to prevent some potential threats around schools. Finally, schools may diagnose the campus security problems and develop some recent, middle and long-term objectives and action strategies for managers to enhance the campus security. According to these suggestions, it may be found that some recommendations related to the operational problems of managing the CSRS. Some are suggested to improve the preventative function rather than handling or dealing with events. Another of the suggestions is to integrate the CSRS with a wider social resource, inasmuch as recommendations not only focused on managing the events on campus but also on connecting the educational system with the society.

In order to promote the cities/counties management ability, the CSRC also proposed some recommendations to those managers. Firstly, every city/county may enhance the dissemination and publicising of the campus disaster management work. From a management point of view, the responsibility of risk management is not only one for a single person or department but also for every internal staff member. Secondly, local governors may examine the school manager's ability in dealing with the contingencies found within their region. Third, city/county managers may develop some possible preventative strategies to handle the possible emergency events according to the city's characteristics and staff ability. Fourth, each city/county may integrate the existing resources and evaluate the internal organizational abilities in monitoring the emergency events; also the government regimes may establish a cooperative relationship across city and city. The last suggestion is to link information and practice to police regimes across the organizational boundary to educational institutions by suggesting the police ban the dangerous driver and enforce a ban on students driving without licenses. Achieving the

suggestion above, it is assumed in the Reports that every city may alleviate the harm to students substantially.

Beyond the Reports' substantive recommendations, the CSRC has also reviewed how the system itself is working. A number of recommendations have been made through these reviews. First of all, the reporting system may redevelop its function to make it in as much accordance as possible with the requirements of managers as operators at the school level. Also, according to the operators' experiences, it is hard to classify some incidents according to the categories available on the system. Then the data analysis task may be influenced by the reporting of information because the recorded data at the system were not exactly matching every requirement on system. In addition, the CSRC may take responsibility to improve the environmental safety for students by cooperating with police forces and promoting a cross-ministry partnership arrangement. Finally, a last point addressed is the environmental safety for children, focusing on an improvement in students' ability in self-protection through better personal judgments and viewpoints, while a second goal is to list the students in high-risk families and in disadvantaged groups to reduce the cases of abused children. In such cases, school may link the tasks of the education department with social welfare institutions in the city to limit the possible cases of risk.

Clearly, both the reviews and recommendations to schools, cities/counties and the CSRC managers indicated the extensive and general issues from different viewpoints. Some reviews highlight the universal problems at schools from primary to university. Schools at different levels have different events, depending on the different characteristics of local practices and context or the geographic locations of schools. However, some events may be caused by similar causes; some may appear because of a wider range of factors, which is hard to pick up by studying the annual reports. Most suggestions to cities/counties recommended some broad management strategies. Not surprisingly, this may be a common feature of policy made by a hierarchical organisation. From the management point of view, the government highlighted the questions and problems for subordinate regimes. The local managers are encouraged to follow the advice to make some suitable plans for themselves; such schemes may be more perceived as being more reliable and effective for risk management and more acceptable to local culture where a hierarchical system is in place.

4.6 The analyses of the recorded data in the CSRS

The discussion above highlights the operation procedure and the actual function of the CSRS. Obviously, it may provide an effective function for managing risky events across a country and may improve the range of tasks by the modification of categories. The management centre also produces some reviews and recommendations year by year; such suggestions may give the local managers some references for preventing some potential or similar events happened on campus. Although the annual reports showed the basic event patterns year by year, they provided just a rough sketch of the actual incidence of risk-related events. Therefore, I tried to explore the actual recorded data across five years and in doing so produce some of my own raw data on risk trends which has never been discussed or explored before.

The previous section noted that the CSRS was established in 2000. It is unavoidable that a new system may need to operate for a few years before it achieves its full functionality. Therefore, the analysis of data recorded in the CSRS is focusing on the middle five years from 2004 to 2008. According to the database provided by the CSRC which I was given access to through my fieldwork contacts in Taiwan, the total number of events, which included all at the A, B and C levels, recorded in the system were 117,066 cases between 2004 and 2008 (see Table 4.6.1).

As can be seen, just over one-third (30.2 %) of the events recorded were A-level (35,315 cases), and over ten per cent of the events were reported as B-level (13,358 cases). Most of events were classified at C-level (68,393 cases) which covered over half of whole events. It may be worth highlighting the similar trends of events with the percentage of 16.9, 16.8 and 16.7 respectively in 2004, 2005 and 2006; however, the number of events has increased significantly to 21.7 % in 2007; the number then reached its highest peak (27.9 %) in 2008 which can be seen at the bottom row of the Table. Also, onec an note that there were 36.7 % (12,946 cases) of the A-level events occurring in 2008, which is much higher than those in the other four years. Consequently, nearly one-third of the proportion (32,603 cases) appeared in this year, which presents a significant rise in the total events between 2004 and 2008.

Table 4.6.1 The three levels of event compared over time

levels	Years	2004	2005	2006	2007	2008	Total
A-level	Count	3,886	6,642	4,863	6,960	12,964	35,315
	% within level	11.0%	18.8%	13.8%	19.7%	36.7%	100.0%
	% of Total	3.3%	5.7%	4.2%	5.9%	11.1%	30.2%
B-level	Count	2,643	2,430	2,396	2,627	3,262	13,358
	% within level	19.8%	18.2%	17.9%	19.7%	24.4%	100.0%
	% of Total	2.3%	2.1%	2.0%	2.2%	2.8%	11.4%
C-level	Count	13,230	10,648	12,275	15,863	16,377	68,393
	% within level	19.3%	15.6%	17.9%	23.2%	23.9%	100.0%
	% of Total	11.3%	9.1%	10.5%	13.6%	14.0%	58.4%
Total	Count	19,759	19,720	19,534	25,450	32,603	117,066
	% of Total	16.9%	16.8%	16.7%	21.7%	27.9%	100.0%

4.6.1 The distribution of the main categories of campus security events in the CSRS

After examining the distribution of main categories at different event levels, the following section is focused on the proportion of the eight main categories (see Table 4.6.2). The Table 4.6.2 shows the proportion of each main event, which compared categories within five years, the highest percentage of the campus event was accident event which reached 41,341 cases (35.3 % compared with total number of events). The ‘disease event located at the second place, having over one quarter of the event ratio compared with the total proportion numbering 32,204 cases (27.5 %). Then both of the violence and deviant behaviour and the illegal events involving children and teenagers (under eighteen) were ranked third and the fourth, 15,028 cases (12.8 %) and 13,765 cases (11.8 %) respectively. After that, security-related events were fifth which at 8,458 cases and the proportion is also under 10%. The three lowest counts relating to the categories were ‘other’, ‘natural disaster’ and ‘counseling conflict’ events, which only occupied less six per cent among the three categories in total, their percentage were 2.4, 1.8 and 1.1 respectively.

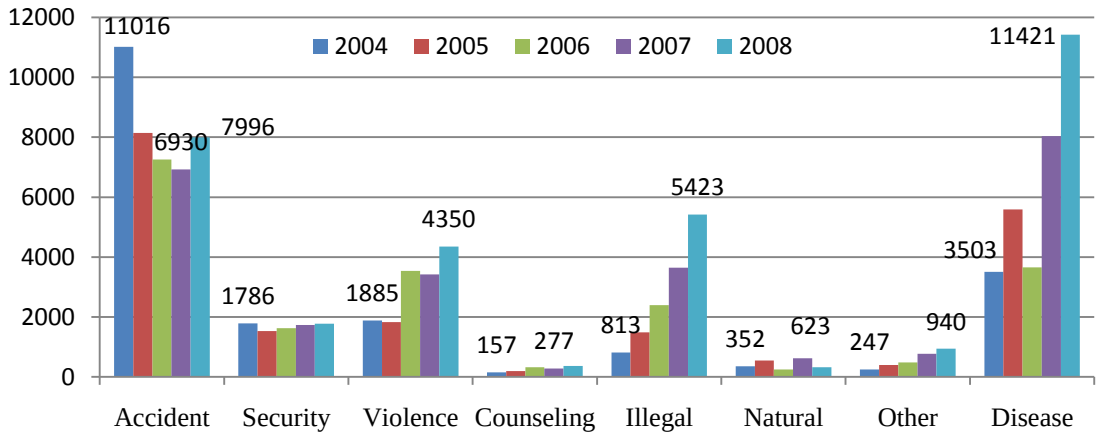
Table 4.6.2 The distribution of main categories compared over five years

Years / Main categories	2004 Count	(%)	2005 Count	(%)	2006 Count	(%)	2007 Count	(%)	2008 Count	(%)	Total Count	(%)
Accident	11016	9.4	8139	7.0	7260	6.2	6930	5.9	7996	6.8	41341	35.3
Security	1786	1.5	1528	1.3	1623	1.4	1739	1.5	1782	1.5	8458	7.2
Violence	1885	1.6	1826	1.6	3544	3.0	3423	2.9	4350	3.7	15028	12.8
Counseling	157	0.1	201	0.2	322	0.3	277	0.2	365	0.3	1322	1.1
Illegal	813	0.7	1486	1.3	2395	2.0	3648	3.1	5423	4.6	13765	11.8
Natural	352	0.3	548	0.5	247	0.2	623	0.5	326	0.3	2096	1.8
Other	247	0.2	404	0.3	485	0.4	776	0.7	940	0.8	2852	2.4
Disease	3503	3.0	5588	4.8	3658	3.1	8034	6.9	11421	9.8	32204	27.5
Total	19759	16.9	19720	16.8	19534	16.7	25450	21.7	32603	27.9	117066	100

The comparison has demonstrated the distribution of the eight main-categories and their proportion from 2004 to 2008. I have then tried to explore the change of the total events which has been presented in the following figure (see Figure 4.6.1). According to the Figure 4.6.1, the most significant increase was in the illegal event category involving children and teenagers (under eighteen), with a five-fold rise from 2004 (813 cases) to 2008 (5,423 cases). The disease event ranked second which also has a large increase of about three times from 3,503 cases reaching a peak of 11,421 cases in this period of time. The violence and deviant behaviour event was located third, doubling from 1,885 to 5,423 cases in five years.

The most obvious decrease was located in the accident event from the peak 11,016 cases in 2004 drop to the lowest point 6,930 cases in 2007, but then it has grown to nearly 8,000 cases in 2008. Some categories remained stable during the five years, for example the security-related events were typically under 2,000 cases, and both the counseling conflict event and natural disaster event saw a slightly fluctuating trend with the average around 250 and 400 cases respectively. Otherwise, there was a gradual increase in the ‘other’ category from over 200 to over 900 in this period time.

Figure 4.6.1 The distribution of main categories compared with the number of events over five years



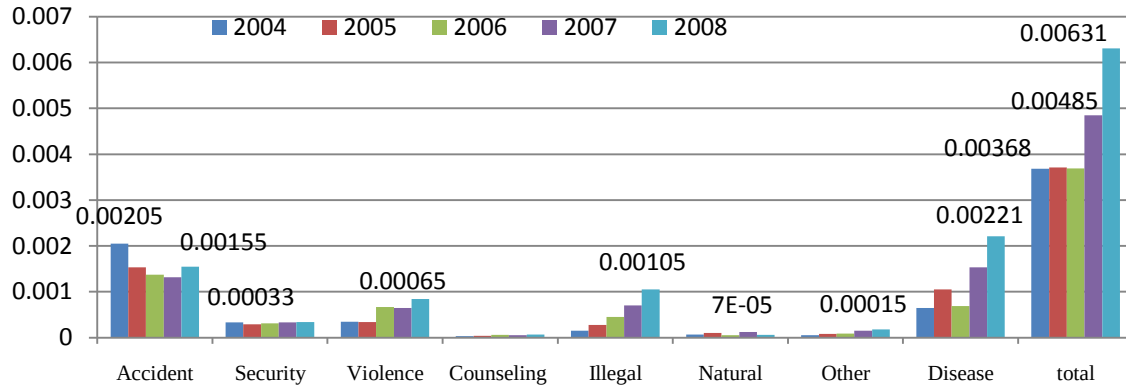
In order to explore this pattern of events more deeply, the comparison of the distribution of the data moved onto the total population of students comparing the number of events with the total population of student, *per 100,000 students* (see Table 4.6.3). The first and the second rows on the left side of the Table show the number of events and their proportion over five years. Then the third row indicates the total population of students, which presented the proportion of event with total numbers of student during the year. Finally, the bottom row describes the proportion of events per 100,000 students. It can be seen that there were 26,387,508 students in total over the five years.

The contrast of the percentage per 100,000 students with total event is located at the fourth column of each year. It shows that 443.64 cases relate to campus security events per 100,000 students. It is worth noticing that the total population of students has a significant decrease from 5,372,346, in 2004 to 5,165,831, in 2008. However, the proportion of events when compared to the total population did not reduce at the same rate. It remained stable at around 0.368 %, 0.371 % and 0.369 % in 2004, 2005 and 2006 respectively, but the percentage then has increased significantly to 0.484 % in 2007 and reached the peak at 0.631 % in 2008 (see Figure 4.6.2).

Table 4.6.3 The distribution of main categories compared over five years

Years	Categories	Accident	Security	Violence	Counseling	Illegal	Natural	Other	Disease	total
2004	Number of events	11016	1786	1885	157	813	352	247	3503	19759
	% with total event	9.41	1.53	1.61	0.13	0.69	0.30	0.21	2.99	16.90
	The number of students 5372346	0.00205	0.00033	0.00035	0.00003	0.00015	0.00007	0.00005	0.00065	0.00368
	Every 100,000 students	205.05	33.24	35.09	2.92	15.13	6.55	4.60	65.20	367.79
2005	Number of events	8139	1528	1826	201	1486	548	404	5588	19720
	% with total event	6.95	1.31	1.56	0.17	1.27	0.47	0.35	4.77	16.80
	The number of students 5319364	0.00153	0.00029	0.00034	0.00004	0.00028	0.00010	0.00008	0.00105	0.00371
	Every 100,000 students	153.01	28.73	34.33	3.78	27.94	10.30	7.59	105.05	370.72
2006	Number of events	7260	1623	3544	322	2395	247	485	3658	19534
	% with total event	6.20	1.39	3.03	0.28	2.05	0.21	0.41	3.12	16.70
	The number of students 5286885	0.00137	0.00031	0.00067	0.00006	0.00045	0.00005	0.00009	0.00069	0.00369
	Every 100,000 students	137.32	30.70	67.03	6.09	45.30	4.67	9.17	69.19	369.48
2007	Number of events	6930	1739	3423	277	3648	623	776	8034	25450
	% with total event	5.92	1.49	2.92	0.24	3.12	0.53	0.66	6.86	21.70
	The number of students 5243082	0.00132	0.00033	0.00065	0.00005	0.00070	0.00012	0.00015	0.00153	0.00485
	Every 100,000 students	132.17	33.17	65.29	5.28	69.58	11.88	14.80	153.23	485.40
2008	Number of events	7996	1782	4350	365	5423	326	940	11421	32603
	% with total event	6.83	1.52	3.72	0.31	4.63	0.28	0.80	9.76	27.90
	The number of students 5165831	0.00155	0.00034	0.00084	0.00007	0.00105	0.00006	0.00018	0.00221	0.00631
	Every 100,000 students	154.79	34.50	84.21	7.07	104.98	6.31	18.20	221.09	631.13
Total	Number of events	41341	8458	15028	1322	13765	2096	2852	32204	117066
	% with total event	35.31	7.22	12.84	1.13	11.76	1.79	2.44	27.51	100.00
	The number of students 26387508	0.00157	0.00032	0.00057	0.00005	0.00052	0.00008	0.00011	0.00122	0.00444
	Every 100,000 students	156.67	32.05	56.95	5.01	52.16	7.94	10.81	122.04	443.64

Figure 4.6.2 The distribution of percentage of main categories compared with total population of students over five years



4.6.2 The distribution of the sub-categories of campus security events in the CSRS

The previous section presented the distribution of eight main categories within five years. This section explores some sub-categories according to their high frequency and the significantly increasing rates which can be seen on the Figure 4.6.2 such as, ‘accident’ event, ‘violence and deviant behaviour’, or a ‘illegal’ event for children and teenager (under eighteen), and ‘disease’ event. As presented in the section 4.5.1, the accident event occupied the highest proportion of all risks, nearly one-third of the events that occurred. According to the CSRC (2008), there are nineteen sub-categories have been classified within the ‘accident’ event category (see Table 4.6.4).

It can be easily seen that the total number of accident events were 41,341 between 2004 and 2008. It is impossible to avoid paying attention to the traffic event off campus, because over half of the 22,170 cases (53.60 %) belonged to it. Moreover, by combining both traffic accidents on campus and outside teaching events with it, the total percentage of traffic events comes to sixty per cent, which showed most of the campuses accident were caused by traffic-related events.

It may worth noting that the proportion of ‘poisoning’ events was only 4.50 % (1,876 cases), but even so it occupies fourth place, compared to all events. Moreover, because of the change in the sub-categories across the five years, it can be seen that the ‘suicide or self-harm’ event was only recorded in first three years, in 2004, 2005 and 2006, and then it was differentiated into three sub-categories: ‘suicide with own child’, ‘student suicide’ and ‘staff suicide’ in 2007. Therefore, combining four sub-categories of the ‘suicide’ event in total, the whole percentage of this category reached 3.4 % (1,405

cases), which raised the incidence of suicide up to the fifth place.

Table 4.6.4 The distribution of the number of sub-categories accident event over five years

Years / Sub-categories Accident	2004 Count	2004 (%)	2005 Count	2005 (%)	2006 Count	2006 (%)	2007 Count	2007 (%)	2008 Count	2008 (%)	Total Count	Total (%)
traffic event on campus	343	0.80	243	0.60	248	0.60	338	0.80	504	1.20	1676	4.10
traffic event out- side teaching course	32	0.10	20	0.00	63	0.20	68	0.20	93	0.20	276	0.70
traffic event off campus	6404	15.50	4528	11.00	3897	9.40	3483	8.40	3858	9.3	22170	53.60
drowning	126	0.30	105	0.30	87	0.20	101	0.20	114	0.30	533	1.30
poisoning	299	0.70	463	1.10	425	1.00	345	0.80	344	0.80	1876	4.50
Injured from playing sport or hobby	2025	4.90	1402	3.40	1364	3.30	1140	2.80	1280	3.10	7211	17.40
fall from building	56	0.10	47	0.10	46	0.10	56	0.10	74	0.20	279	0.70
mountain accident	43	0.10	30	0.10	18	0.00	17	0.00	11	0.00	119	0.30
Injury through experiment	89	0.20	66	0.20	41	0.10	36	0.10	31	0.10	263	0.60
suicide or self-harm	237	0.60	275	0.70	280	0.70	0	0	0	0	792	1.90
injury from re-establishment	12	0.00	6	0.00	7	0.00	14	0.00	11	0.00	50	0.10
injury through building collapse	8	0	8	0	8	0	12	0	6	0	42	0.10
other	1245	3.00	862	2.10	727	1.80	995	2.40	1200	2.90	5029	12.20
injury associated with part-time work	43	0.10	18	0.00	9	0.00	20	0.00	21	0.10	111	0.30
chemical contamination in laboratory	0	0.00	3	0.00	17	0.00	1	0.00	3	0.00	24	0.10
other material	54	0.10	63	0.20	23	0.10	11	0.00	126	0.30	277	0.70
suicide with own child	0	0.00	0	0.00	0	0.00	30	0.10	24	0.10	54	0.10
student suicide	0	0.00	0	0.00	0	0.00	248	0.60	284	0.70	532	1.30
staff suicide	0	0.00	0	0.00	0	0.00	15	0.00	12	0.00	27	0.10
Total	11016	26.60	8139	19.70	7260	17.60	6930	16.80	7996	19.30	41341	100

The above section examined the sub-categories of accident event. The following section explores the other sub-categories linked to violent and deviant behaviour. According to the CSRC (2008), twenty-seven sub-categories have been categorized into such events (see Table 4.6.5). As can be seen, the highest percentage event was the ‘general fight’ event, which comprised almost 43% in this sub-category. Also the actual number of this event has nearly doubled from 829 cases in 2004 to 1,642 cases in 2008. Moreover, the other campus violence and deviance behaviour events ranked second with 2,779 cases (18.5 %). It may hard to determine the actual content of the sub-category of ‘other’ because it includes any event that could not be classified into the sub-category of ‘violent and deviant behaviour’. One way in which a researcher might identify what was included within this category would be to check the reporting data on a case-by-case basis.

Furthermore, some sub-categories may deserve more attention because of their significant increase over the five years. For example, there was a more than four times

rise in students suspected of behaving in such a way as to contravene “the drugs prevention and cure law”, from 124 cases in 2004 to 477 cases in 2008, which presumably reflects a perception of the domestic increase in the use of illegal drugs among students in Taiwan. The other case which may be worth mentioning is the incidence of gang violence on campus, inasmuch as although there were only 7 cases in 2004, this has increased ten times to the peak, with 73 cases in 2006; it then gradually decreased to 33 cases in 2007. After that, it has risen slightly again to 35 cases in 2008, but the event growth ratio still shows a five-fold increase between the years 2004 -2008.

The change in some other sub-categories may also be worth noting, such as the rate of suspects involved in stealing which ranked fourth (6.9 %) in the violent and deviant behaviour category, with a doubling of cases from 166 in 2004 to 333 in 2008. Also, the incidence of cases of students running away from home (under senior high school) was ranked fifth (686 cases 4.6 %), and increased gradually from 107 cases to 166 cases, between 2004 and 2008. Generally speaking, most of the violent and deviant behaviour events may regard as visible physical conflict on campus; however, some events may be hard to prevent such as gang violence on campus because such cases sometimes happen on the outside of a campus or produce some psychological trauma to students or create some emotional and personal difficulties which an individual keeps private, such that the staff/teacher is never aware of this problem on campus. However, such risks appear to indicate that some invisible threats from outside the campus have gradually influenced the campus security. Moreover, some similar conditions might be associated with the problem of use of the internet such as an internet swindle or hacking which may be regarded as less visible threats. Although the first reporting of such events were recorded in 2005 and 2006 respectively, it may be predicted that these less tangible risks and unpredictable related to the use of the internet may happen more and more as digital technology spreads throughout Taiwan.

Table 4.6.5 The distribution of the number of event and the percentage in sub-categories of the violent and deviant behaviour event over five years

Year / Sub-categories of violence and deviant behaviour	2004		2005		2006		2007		2008		Total	
	Count (%)		Count (%)		Count (%)		Count (%)		Count (%)		Count (%)	
Student to fight with weapons	80	0.5	85	0.6	100	0.7	77	0.5	38	0.3	380	2.5
A faction to have a fight	10	0.1	3	0	3	0	1	0	8	0.1	25	0.2
General fight event	829	5.5	758	5	1719	11.4	1479	9.8	1642	10.9	6427	42.8
Suspect involved in killer	21	0.1	19	0.1	15	0.1	9	0.1	14	0.1	78	0.1
Suspect involved in robbery	38	0.3	39	0.3	47	0.3	52	0.3	52	0.3	228	1.5
Suspect involved in threaten	67	0.4	32	0.2	142	0.9	141	0.9	155	1	537	3.6
Suspect involved in kidnap	12	0.1	1	0	3	0	2	0	7	0	25	0.2
Suspect involved in steal	166	1.1	119	0.8	175	1.2	237	1.6	333	2.2	1030	6.9
Suspect involved in gamble	14	0.1	6	0	4	0	4	0	29	0.2	57	0.4
Suspect involved in sexual assault	33	0.2	76	0.5	93	0.6	87	0.6	94	0.6	383	2.5
Suspect involved to sex harassment	39	0.3	70	0.5	100	0.7	128	0.9	194	1.3	531	3.5
Suspect involved to possess firearms	11	0.1	13	0.1	13	0.1	19	0.1	31	0.2	87	0.6
Suspect involved to against the drugs prevention and cure low	124	0.8	103	0.7	148	1	215	1.4	477	3.2	1067	7.1
Suspect involved to hinder the low, order and official business	6	0	5	0	10	0.1	11	0.1	4	0	36	0.2
Suspect involved to hinder families	20	0.1	17	0.1	23	0.2	26	0.2	41	0.3	127	0.8
Illegal car racing	10	0.1	4	0	7	0	6	0	3	0	30	0.2
Other campus violence and deviance behaviour	277	1.8	291	1.9	645	4.3	666	4.4	900	6	2779	18.5
Other illegal event	8	0.1	35	0.2	70	0.5	61	0.4	113	0.8	287	1.9
Run away from home(under senior high school)	107	0.7	130	0.9	125	0.8	158	1.1	166	1.1	686	4.6
Student to harass ceremony	0	0	2	0	6	0	1	0	0	0	9	0.1
Teacher harassment by student	3	0	0	0	10	0.1	5	0	2	0	20	0.1
Gang violence on campus	7	0	15	0.1	73	0.5	33	0.2	35	0.2	163	1.1
A swindle event from internet	0	0	0	0	1	0	1	0	2	0	4	0
A hacker to invade the network system	0	0	2	0	6	0	2	0	6	0	16	0.1
May to do sex business	3	0	1	0	6	0	2	0	4	0	16	0.1
Total	1885	12.5	1826	12.2	3544	23.6	3423	22.8	4350	28.9	15028	100

The discussion of these sub-categories above involves every level of school. The next sub-category was developed and focused on some special clients on campus. The main category of "illegal event involving children and teenagers" only addressed on the students under eighteen. Although this category only covers parts of the population in schools, the trend of events showed a significant increase over five years. According to the CSRC (2008), nineteen sub-categories have been classified into this category (see Table 4.6.6). The highest percentage located in event caused by 'sexual assault' (under eighteen), followed by 'sex harassment' (under eighteen), the number of cases reached 3,287 (23.9 %) and 1,612 (11.7 %) respectively. Both events also contained high increase of the proportion over five years. For example, in 2004, only 79 cases regarded to the 'sexual assault' event; however, it were nearly five times higher in 2005 (383 cases), and the number of this event continued growing up to 1,249 cases in 2008,which were fifteen times higher than the number in 2004. Notably, cases of sexual harassment increased almost thirty times from 2004 (24 cases) to 2008 (709 cases). The third place created by 'running away from home in three days' with 1,391 cases in total (10.1 %)

and it were a slight risen from 229 cases in 2004 to 347 cases in 2008.

More generally, there were some remarkable cases worth highlighting and comparing over the five years of data; for example, Table 4.6.6 shows there were 1,352 cases in total caused by an 'abuse' event showing an increase from 38 cases in 2004 to 233 cases in 2006 then to 524 cases in 2008. Furthermore, the 'high risk family' also may worth mentioning; although it only ranked fifth with 1,074 cases (7.8 %), and there was only one case in 2005; however, it reached 63 cases in 2006, which is sixty times higher than the number in 2005; after that, another sixty times increase appeared in 2008 with 602 cases. Finally, the sub-category of 'the use of harmful drugs' hadh 824 cases (6 %) over five years, but it actually grew nearly sixty times between 2004 and 2008, from 6 to 557 cases.

Table 4.6.6 The distribution of the number of events and the percentage in sub-categories of illegal activity involving children and teenagers (under 18) event over five years

Years / Sub-categories of illegal event involving children and teenagers (under 18)	2004		2005		2006		2007		2008		Total	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Student to drift	106	0.8	145	1.1	202	1.5	190	1.4	232	1.7	875	6.4
Student into the illegitimate place	5	0	1	0	3	0	9	0.1	5	0	23	0.1
Runaway from home(in three days)	229	1.7	251	1.8	263	1.9	301	2.2	347	2.5	1391	10.1
Protect client from illegal event	137	1.0	62	0.5	75	0.5	85	0.6	139	1.0	498	3.6
An abandonment case	48	0.3	7	0.1	6	0	16	0.1	16	0.1	93	0.7
Other children protect case	111	0.8	167	1.2	323	2.3	361	2.6	630	4.6	1592	11.6
Adult to compel children to marry	1	0	2	0	1	0	0	0	0	0	4	0
Illegal to utilize children	1	0	1	0	1	0	3	0	2	0	8	0.1
Kidnap or sell children or teenager	1	0	8	0.1	9	0.1	14	0.1	6	0	38	0.3
To force children to sex assault	19	0.1	72	0.5	83	0.6	124	0.9	134	1.0	432	3.1
To take noxious tapes	0	0	1	0	3	0	17	0.1	22	0.2	43	0.3
To use harmful drug	6	0	38	0.3	63	0.5	160	1.2	557	4.0	824	6.0
Children may involved the sex business	3	0	13	0.1	21	0.2	31	0.2	42	0.3	110	0.8
An abuse event	38	0.3	172	1.2	233	1.7	385	2.8	524	3.8	1352	9.8
Other against children low event	5	0	23	0.2	40	0.3	33	0.2	62	0.5	163	1.2
Sexual assault(under18)	79	0.6	383	2.8	622	4.5	954	6.9	1249	9.1	3287	23.9
Sex harassment(under 18)	24	0.2	116	0.8	317	2.3	446	3.2	709	5.2	1612	11.7
Sexual assault cause pregnancy(un 18)	0	0	23	0.2	67	0.5	111	0.8	145	1.1	346	2.5
High risk family	0	0	1	0	63	0.5	408	3.0	602	4.4	1074	7.8
Total	813	5.9	1486	10.8	2395	17.4	3648	26.5	5423	39.4	13765	100

What about the 'disease' category over the five years? According to the CSRC, ten sub-categories have been classified into the 'disease' category (see Table 4.6.7). As can be seen from Table 4.4-7, there were 16,716 cases (51.9 %), over half of the percentage

in total were linked to the ‘Enterovirus’ disease. It has increased significantly from 1,233 cases in 2004 to 4,061 cases in 2005; it then dropped back to a low point in 2006 (1,245 cases); after that, the cases have significant increased to 2,613 cases in 2007 and reached a peak in 2008 (at 7,564 cases).

Moreover, the ‘Swinepox’ disease was positioned third with 3,733 cases in total (11.6 %). It has increased from 47 cases in 2004 to 490 cases in 2006, then it reached a peak in 2008 (1,996 cases). Otherwise, it may be worth noting that, combining 2007 and 2008, the number of events contained over half of the proportion (over 60 %) compared to the events over five years. Generally speaking, except that the general disaster has slightly decreased in 2008, most of the sub-categories of disaster events show no extraordinary trend over five years period without the ‘Enterovirus’, ‘Swinepox’ and ‘Ophthalmic’ diseases.

Table 4.6.7 The distribution of the number of event and the percentage of sub-categories of the disease category over five years

Years	2004		2005		2006		2007		2008		Total	
Sub-categories of disease	Count (%)		Count (%)		Count (%)		Count (%)		Count (%)		Count (%)	
General disaster	2033	6.3	1248	3.9	1556	4.8	2732	8.5	1384	4.3	8953	27.8
Enterovirous	1233	3.8	4061	12.6	1245	3.9	2613	8.1	7564	23.5	16716	51.9
Tuberculosis	122	0.4	109	0.3	103	0.3	99	0.3	167	0.5	600	1.9
Scarlet fever	16	0	30	0.1	63	0.2	29	0.1	49	0.2	187	0.6
Peruses	2	0	0	0	2	0	1	0	13	0	18	0.1
Swinepox	47	0.1	107	0.3	490	1.5	1093	3.4	1996	6.2	3733	11.6
Dengue fever	28	0.1	25	0.1	77	0.2	107	0.3	40	0.1	277	0.9
SARS	10	0	0	0	0	0	0	0	0	0	10	0
Other	12	0	8	0	122	0.4	315	1.0	140	0.4	597	1.9
Ophthalmic	0	0	0	0	0	0	1045	3.2	68	0.2	1113	3.5
Total	3503	10.9	5588	17.4	3658	11.4	8034	24.9	11421	35.5	32204	100

The discussion above showed the diversity of campus security events which were divided into eight main categories. After being modified a few times, there are one hundred and nineteen sub-categories in 2008. The top twenty of the events have been selected which depended on the number of events in total between 2004 and 2008, and they are shown below in Table 4.6.8. In the following section I will compare some factors with each category, which may help to discover more significant reporting trends over time.

Table 4.6.8 The top ten of the sub-categories between 2004 and 2008

S/N	Sub-categories	Count	% in total	Main-category
1	Traffic event out of campus	22170	18.9	Accident
2	Enterovirous disease	16716	14.3	Disease
3	General disease	8953	7.6	Disease
4	Injured from playing sport or hobby	7211	6.2	Accident
5	General fighting	6427	5.5	Violence
6	Other accident event	5029	4.3	Accident
7	Swinepox	3733	3.2	Disease
8	Sexual assault (under 18)	3287	2.8	Illegal
9	Other campus violence event	2779	2.4	Violence
10	Poisoning	1876	1.6	Accident
11	Traffic event in campus	1676	1.4	Accident
12	Other property loss by theft	1635	1.4	Security
13	Equipment loss by theft	1615	1.4	Security
14	Sex harassment (under 18)	1612	1.4	Illegal
15	Other children protect case	1592	1.4	Illegal
16	Runaway from home(in 3 days)	1391	1.2	Illegal
17	Abuse event	1352	1.2	Illegal
18	Other campus security event	1288	1.1	Security
19	Strong wind	1127	1	Natural
20	Ophthalmic	1113	1	Disease

4.6.3 The distribution of the campus security events

The previous section explored the particular sub-categories used in the reporting system and the broad patterns and range of changes seen over the levels of incidence of different types of risk-events as reported by operators. The focus was exclusively on events that occurred within the context of the campus. In this section I will examine the data in regard to some other broader factors beyond the campus in general, such as region, gender, season and time, which may, from a management of risk perspective, suggest other factors shaping the trends of the events. Such factors were main detail of events which were provided by school managers. Studying such factors may help to discover some unknown results and patterns of event. According to the previous discussion, the recorded data in the CSRS were reported by the local school managers around the country. Therefore, the examination of the distribution of the events with the regional factor is the first main concern of this section.

In Taiwan, the twenty-five cities/counties are divided across the territory (as shown in Figure 4.6.3). There is no doubt that the population of each city may be divergent between urban and rural areas. In order to analyze the proportion of students within each area, this was secured from information published on the Ministry of Education's web page, (see Table 4.6.9). Table 4.6.9 shows some statistical information, including the number of events, the number of students and the proportional rate of events, which were counted across five years. The first and second column shows the number and the percentage of events in the period. The third and fourth columns record the number of students and the incidence per ten thousand of students in cities/counties. Finally, the

extreme right column presents statistical data reporting the total number of events by city and the incidence per ten thousand students, again over the five years.

According to Table 4.6.9, the top five cities with the highest numbers of cases were Keeling city, Taipei city, Hsinchu city, Kaohsiung county and Pingtung county within which the number of cases were 22,762, 14,077, 9,385, 8,352 and 8,326 respectively. It is worth noting that, except for Hsinchu city, the other four cities/counties are located at the edge of the territory, for example Keeling City and Taipei City are at the most northern and Kaohsiung and Pingtung County at the most southern ends of the country. It is also interesting to point out that both Taichung City and Changhua County are located at the middle of the country. They have very similar rates in the number of events and their incidence per ten thousand students with a difference of nearly ten thousand in the total population of students over the five years.

The Table also shows a significant change when we compare the number of events per every ten thousand students by analyzing against the factor of region. It may be explained that the high event reporting rate may be much higher in a city. For example, compared with other cities, Keelung has the highest reporting rate with over two thousand cases (22,762) across five years, and the incidence is same as ranked. However, diversified trends may appear if the number of students in the city was counted in. For example, there is a dramatic change appearing in Hualien and Penghu counties, and they have only 4,228 and 3,645 cases in total over five years while the incidence rate reached the second and the fourth place with around 150.83 per ten thousand students in Penghu and 103.86 per ten thousand students in Hualien.

Consequently, if the number of students is taken into the consideration of the measurement factor of events at both the cities above, the incidence of jumps up to the second (150.83 per ten thousand students in Penghu County) and fourth (103.86 per ten thousand students in Hualien county) place when comparing all cities. Finally, the total incidences across the three years have similar rates at around 36 to 37 per ten thousand students in total among 2004, 2005 and 2006, as shown on the bottom of the Table, but then this has almost doubled to 63.11 per ten thousand students in 2008.

Figure 4.6.3 The twenty-five cities and counties in Taiwan

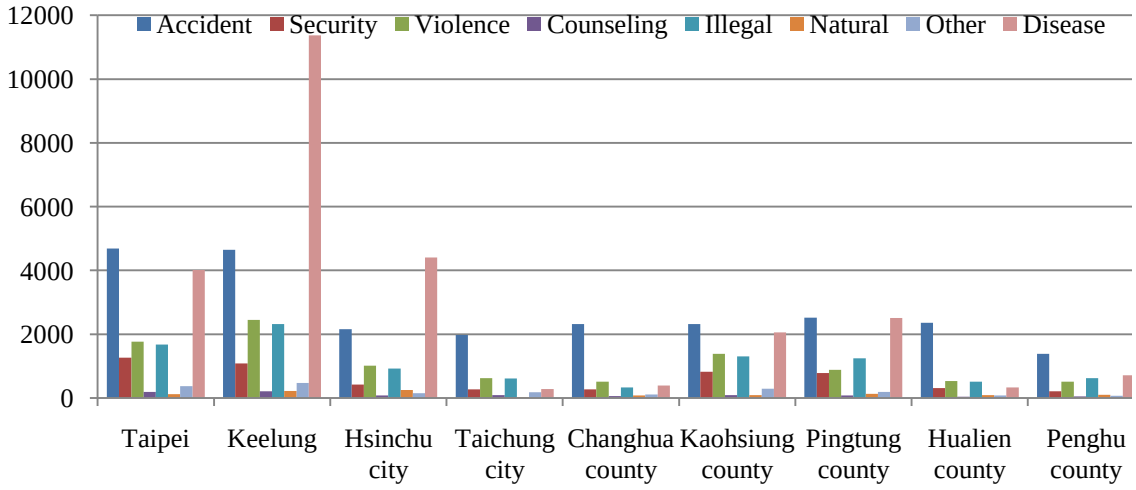
Source: http://www.esltaiwan.com/articles/44/1/Map-of-Taiwan/Page1.html 01072010

Table 4.6.9 The distribution of event by cities over a five year period

Years / Statistic of the event / Cities/counties	2004				2005				2006				2007				2008				Total	
	Event in this year	% in this year	Total student in year	Incidence per 10,000 students in city	Event in this year	% in this year	Total student in year	Incidence per 10,000 students in city	Event in this year	% in this year	Total student in year	Incidence per 10,000 students in city	Event in this year	% in this year	Total student in year	Incidence per 10,000 students in city	Event in this year	% in this year	Total student in year	Incidence per 10,000 students in city	Total event in city	Incidence per 10,000 students in city over 5 years
Taipei city	2385	0.121	724117	32.94	2693	0.137	715366	37.65	2454	0.126	712950	34.42	2977	0.117	706674	42.13	3568	0.109	696606	51.22	14077	39.59
Kaohsiung	183	0.009	330535	5.54	193	0.010	330171	5.85	235	0.012	328693	7.15	326	0.013	328248	9.93	380	0.012	323320	11.75	1317	8.03
Keelung city	2594	0.131	88462	293.23	3783	0.192	87733	431.19	3492	0.179	86881	401.93	5843	0.230	86031	679.17	7050	0.216	84325	836.05	22762	525.16
Taipei county	360	0.018	802870	4.48	264	0.013	783624	3.37	305	0.016	768933	3.97	316	0.012	757959	4.17	563	0.017	743629	7.57	1808	4.69
Tao yuen	912	0.046	472313	19.31	750	0.038	472595	15.87	843	0.043	477164	17.67	1040	0.041	479852	21.67	1585	0.049	479680	33.04	5130	21.54
Hsinchu county	443	0.022	112224	39.47	274	0.014	111330	24.61	280	0.014	111450	25.12	482	0.019	111162	43.36	671	0.021	109439	61.31	2150	38.70
Hsinchu city	1538	0.078	129511	118.75	1510	0.077	132114	114.30	1410	0.072	132840	106.14	2108	0.083	134339	156.92	2819	0.086	134687	209.30	9385	141.45
Miaoli county	704	0.036	126832	55.51	388	0.020	122868	31.58	396	0.020	121710	32.54	487	0.019	119643	40.70	521	0.016	117380	44.39	2497	41.04
Taichung county	1043	0.053	346956	30.06	858	0.044	348537	24.62	702	0.036	348192	20.16	1218	0.048	347422	35.06	2040	0.063	342089	59.63	5861	33.82
Taichung city	783	0.040	345003	22.70	720	0.037	345503	20.84	908	0.046	343179	26.46	747	0.029	340713	21.92	901	0.028	335874	26.83	4059	23.73
Changhua county	649	0.033	264230	24.56	757	0.038	260581	29.05	829	0.042	257303	32.22	862	0.034	254435	33.88	968	0.030	250822	38.59	4065	31.58
Nantou county	342	0.017	96899	35.29	340	0.017	95849	35.47	386	0.020	96532	39.99	369	0.014	95695	38.56	659	0.020	94348	69.85	2095	43.71
Yunlin county	359	0.018	141273	25.41	354	0.018	140680	25.16	559	0.029	140539	39.78	397	0.016	140288	28.30	319	0.010	138977	22.95	1988	28.33
Chiayi county	626	0.032	104012	60.19	838	0.042	103765	80.76	678	0.035	103126	65.74	618	0.024	102391	60.36	743	0.023	99699	74.52	3503	68.29
Chiayi city	640	0.032	82219	77.84	481	0.024	81164	59.26	296	0.015	81372	36.38	502	0.020	80293	62.52	503	0.015	80052	62.83	2422	59.79
Tainan county	1084	0.055	291027	37.25	807	0.041	287684	28.05	792	0.041	283498	27.94	758	0.030	277663	27.30	811	0.025	272437	29.77	4252	30.11
Tainan city	620	0.031	183267	33.83	533	0.027	182840	29.15	570	0.029	179617	31.73	605	0.024	176481	34.28	766	0.023	171925	44.55	3094	34.60
Kaohsiung county	1388	0.070	290692	47.75	1245	0.063	283753	43.88	1417	0.073	281446	50.35	1750	0.069	277387	63.09	2556	0.078	272116	93.93	8356	59.46
Pingtung county	1374	0.070	191884	71.61	1205	0.061	187021	64.43	1172	0.060	185620	63.14	1919	0.075	183204	104.75	2656	0.081	178944	148.43	8326	89.85
Yilan county	31	0.002	95390	3.25	38	0.002	94629	4.02	72	0.004	93669	7.69	72	0.003	92116	7.82	93	0.003	90230	10.31	306	6.57
Hualien county	853	0.043	82806	103.01	581	0.029	81499	71.29	763	0.039	81817	93.26	865	0.034	81228	106.49	1166	0.036	79738	146.23	4228	103.86
Taitung county	238	0.012	41859	56.86	222	0.011	41936	52.94	247	0.013	41942	58.89	279	0.011	41281	67.59	310	0.010	40855	75.88	1296	62.35
Penghu county	558	0.028	15509	359.79	712	0.036	15742	452.29	675	0.035	15649	431.34	840	0.033	15822	530.91	860	0.026	178944	48.06	3645	150.83
Kinmen	50	0.003	11063	45.20	174	0.009	10986	158.38	52	0.003	11378	45.70	63	0.002	11391	55.31	90	0.003	11613	77.50	429	76.02
Matsu	2	0.000	1439	13.90	0	0.000	1395	0.00	1	0.000	1340	7.46	6	0.000	1344	44.64	5	0.000	1316	37.99	14	20.49
Unknow	0				0					0			1	0			0				1	0
Total	19759	1	5372346	36.78	19720	1	5319364	37.07	19534	1	5286885	36.95	25450	1	5243082	48.54	32603	1	5165831	63.11	117066	44.36

In order to explore the context of some cities with a disproportionately high level of incident, I tried to compare those cities/counties with the higher event rate by exploring the rates in eight main categories and the distribution of the proportion, as shown in Figure 4.6.4. The nine cities have been selected by the comparison of the proportion of the number of events to the number of students in those cities. It is evident that Keelung was the highest recorded city because of the huge quantity of disease cases with over ten thousand of the cases in this period of time. The similar condition also made Taipei and Hsinchu cities ranked as the second and third places compared with all the other cities/counties. According to the Figure 4.6.4, the accident event was nearly equal in trends both in Taipei and Keelung cities; however, the total population of students in Taipei is nearly ten times more than that of Keelung, which can be seen in Table 4.6.9. Generally speaking, the accident event was recorded as the biggest problem in most cities/counties compared with other categories; however, the disease event also may cause some concern within cities/counties such as in both Keeling and Hsinchu.

Figure 4.6.4 The distribution of event according to the higher proportion at nine cities over the five year period



Analysing the CSRS data with regional factors as above may provide another aspect to explore more fully since it points to rates as they vary across the rural or urban city, especially in the north or south of the country, which exhibit a significant difference. Exploration of the CSRS database with other factors may provide more information about the trends seen. Consequently, in the following section I try to explore the distribution of the eight main categories with regard to gender. However, whereas I could measure, as above, trends with knowledge of total student numbers for any city, I

can only discuss gender through the data recorded within the system (see Table 4.6.10).

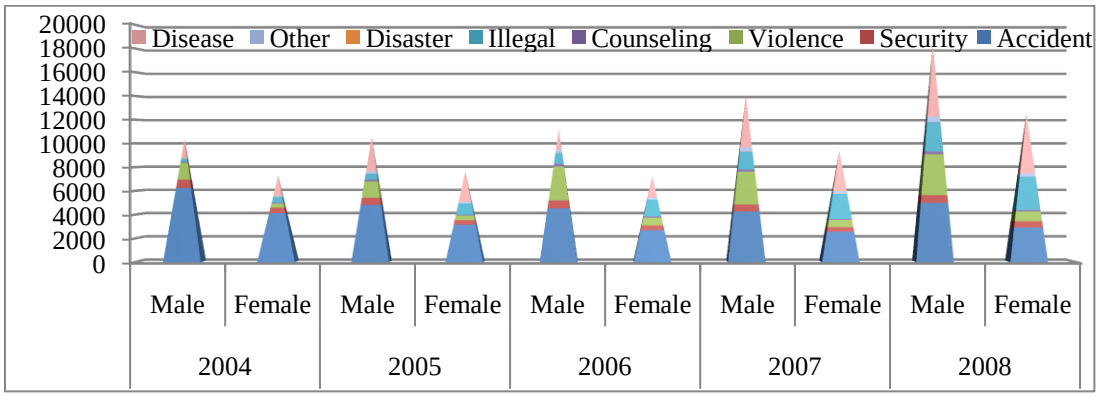
According to the Table 4.6.10, 'violent and deviant behaviour' events are principally associated with male (80.6 %) compared to female (19.4 %) students, around eight to two. In contrast, the proportion recorded in the 'illegal event for children and teenager (under eighteen)' demonstrates the opposite trend, in that it was near six in female (57.8 %) to four in male (42.2 %).

It is interesting to note that most of the proportion of male to female was six to four, including 'accident' events, the 'security-related' events, 'counseling conflict' events, 'natural disasters' and 'other' events. This proportion showed the frequency of campus security events are overall recorded as related to male more than female students.

Table 4.6.10 The distribution of the main event compared gender with five year

Main categories	Years	2004		2005		2006		2007		2008		Total	
		Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Accident event	Male	6241	15.5	4810	12.0	4528	11.3	4269	10.6	4997	12.4	24845	61.7
	Female	4109	10.2	3150	7.8	2669	6.6	2562	6.4	2910	7.2	15400	38.3
Security-related event	Male	696	13.1	596	11.2	669	12.6	572	10.8	646	12.2	3179	60
	Female	457	8.6	366	6.9	406	7.7	382	7.2	512	9.7	2123	40
Violence & Deviance behaviour	Male	1424	9.7	1387	9.4	2842	19.3	2773	18.8	3437	23.4	11863	80.6
	Female	356	2.4	394	2.7	652	4.4	608	4.1	842	5.7	2852	19.4
Counseling conflict event	Male	91	7.2	129	10.3	219	17.4	181	14.4	241	19.2	861	68.4
	Female	47	3.7	67	5.3	93	7.4	83	6.6	107	8.5	397	31.6
Illegal event for children & teenager (under 18)	Male	248	1.8	522	3.9	933	6.9	1503	11.1	2478	18.4	5684	42.2
	Female	501	3.7	942	7.0	1422	10.5	2104	15.6	2831	21	7800	57.8
Natural Disaster event	Male	46	27.1	18	10.6	7	4.1	25	14.7	18	10.6	114	67.1
	Female	37	21.8	6	3.5	1	0.6	3	1.8	9	5.3	56	32.9
Other Campus event	Male	98	4.6	201	9.4	224	10.5	324	15.2	450	21.1	1297	60.7
	Female	72	3.4	131	6.1	152	7.1	230	10.8	254	11.9	839	39.3
Disease evnet	Male	1567	5.0	2918	9.3	1715	5.5	4409	14.1	6124	19.5	16733	53.4
	Female	1699	5.4	2560	8.2	1871	6.0	3375	10.8	5115	16.3	14620	46.6

Figure 4.6.5 The distribution of the main event compared gender with five year



Following this brief comparison by gender, what we see in respect to any correlation such comparison may help to discover more possible trends of event (see Table 4.5.11). Before discussing the detail of time, we need to bear in mind that in Taiwan, the academic year has two semesters, from September to January, with the second one running from February to June.

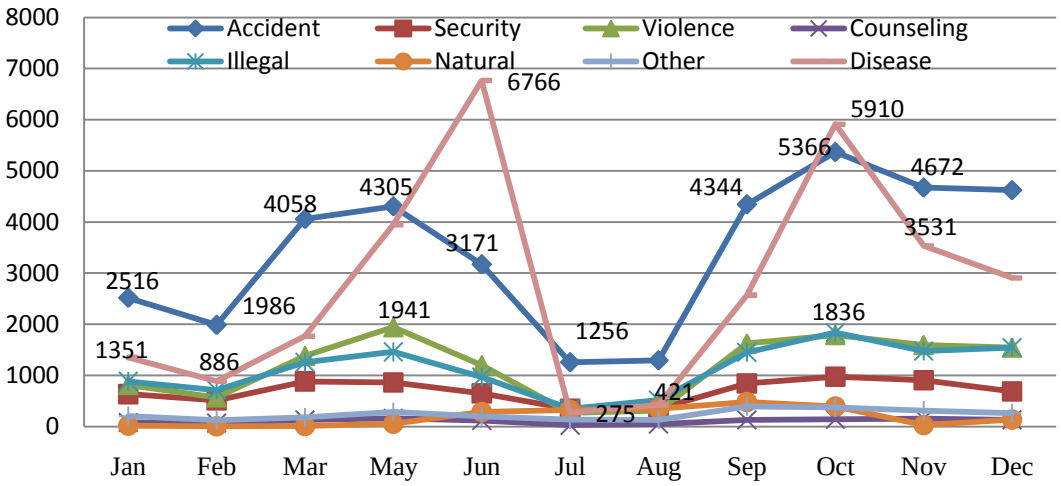
As can be seen from Table 4.6.11, there are two time peaks directly associated with accident event; the highest rate was on October (5,366 cases) which is one month after the start of new academic year. The second peak shows in May (4,305 cases), two months before the end of the second term. Security-related events have a slight fluctuation during the term. The violence and deviance behaviour event has a similar trend to that of the accident event, but the highest peak was in April (1,999 cases) and the second one appears in October (1,788 cases) (see Figure 4.6.6).

Otherwise, illegal events relating to children and teenagers (under eighteen) also reached the highest rate in October (1,836 cases). Finally, disease events had the highest number of events in June (6,766 cases) and the second peak in October (5,910 cases). Generally speaking, the first peak of events appeared in October, the second month of new academic year, and the second one was in June, the final month of the second term.

Table 4.6.11 The distribution between the main-categories and month

Main-categories \ Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Accident event	2516	1986	4058	3752	4305	3171	1256	1294	4344	5366	4672	4621	41341
Security-related event	633	512	883	821	862	650	344	345	844	973	906	685	8458
Violence & Deviance behaviour	811	570	1381	1999	1941	1201	266	311	1623	1788	1594	1543	15028
Counseling conflict vent	80	67	127	142	161	116	26	50	128	142	152	131	1322
Illegal event for children & teenager (under 18)	883	709	1255	1322	1459	966	348	518	1449	1836	1476	1544	13765
Natural Disaster event	14	4	11	26	54	287	321	350	479	390	27	133	2096
Other Campus even	206	125	178	250	287	198	134	131	392	376	313	262	2852
Disease event	1351	886	1766	1876	3948	6766	275	421	2569	5910	3531	2905	32204
Total	6494	4859	9659	10188	13017	13355	2970	3420	11828	16781	12671	11824	117066

Figure 4.6.6 The distribution of event by month over a five year period



In general, examining the campus security events by time has presented multiple and significant trends across five years. The data also allow us to examine time not merely by month or by time of event during a 24 hour period (see Table 4.6.12). The Table 4.6.12 shows the highest peak of the accident events appeared at 11.00a.m., one hour before the break time in the midday, the second and third high frequencies were at 9.00 a.m., one hour after the start of classes, and at 4.00p.m., nearly one hour before the classes are over. Furthermore, a similar daily pattern occurs in the violence and deviance behaviour event (see Figure 4.6.7).

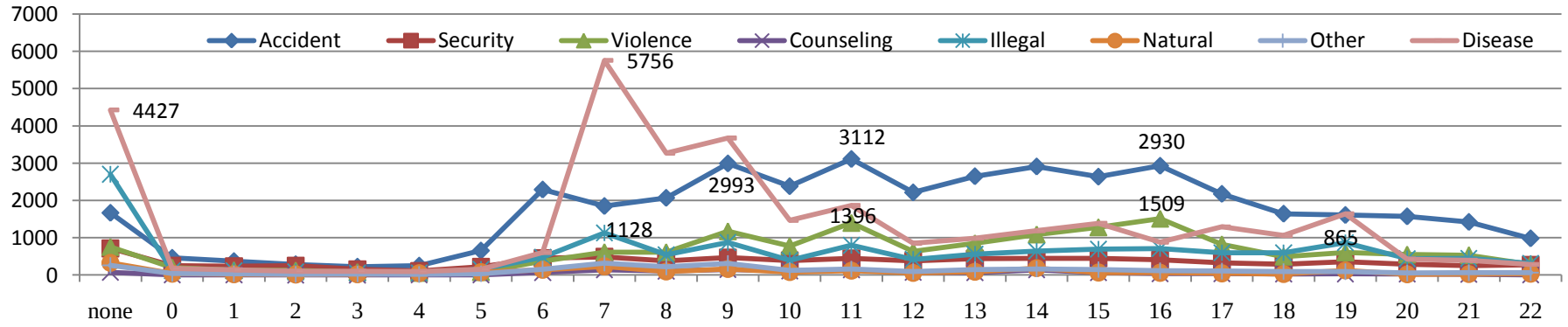
Moreover, it is worth noting that the high proportion of the counseling conflict event occurred at a particular time. For example, the first peak appeared at one hour before the start of school, and the second one happened at one hour after the first class. The third high frequency came off before the lunch time, and the forth took place at the second class after lunch break. Otherwise, not surprisingly, most of the illegal events for children & teenager (under eighteen) and disease events were reported at the start of the school which is the principal time a school will contact its students.

Generally speaking, the highest proportion of events, in total, appeared at the starting time of the school from 7.00-8.00a.m. as shown in the bottom row. After that, the second and third peaks happened at around 9.00 and 11.00 a.m. Following this, it dropped to the lowest point at lunch time. Then the cases have gradually increased from after lunch time at 2.00 p.m. Finally, the events combined total categories remained steady between 2.00 and 4.00 p.m., which was over 6,650 and under 6,760 cases.

Table 4.6.12 The comparison of main categories with time (24 hours)

Time categories	none	00:00 00:59	01:00 01:59	02:00 02:59	03:00 03:59	04:00 04:59	05:00 05:59	06:00 06:59	07:00 07:59	08:00 08:59	09:00 09:59	10:00 10:59	11:00 11-59	12:00 12:59	13:00 13:59	14:00 14:59	15:00 15:59	16:00 16:59	17:00 17:59	18:00 18-59	19:00 19:59	20:00 20:59	21:00 21:59	22:00 22:59	Total
Accident event	1667	458	369	285	220	248	653	2292	1849	2069	2993	2381	3112	2215	2649	2911	2638	2930	2176	1643	1608	1572	1422	981	41341
Security-related event	714	248	237	252	151	107	218	454	487	380	471	390	448	380	441	443	450	410	324	289	353	287	253	271	8458
Violence & Deviance behaviour	753	202	131	125	81	59	79	372	615	614	1172	778	1396	631	852	1087	1279	1509	825	494	607	550	532	285	15028
Counseling conflict event	73	2	2	1	1	2	2	68	142	106	148	109	139	74	65	138	67	38	38	28	31	25	19	4	1322
Illegal event for children & teenager (under 18)	2701	115	118	83	56	54	155	474	1128	541	871	391	796	419	559	644	696	708	599	596	865	440	445	311	13765
Natural Disaster event	324	38	21	16	20	49	76	141	232	93	159	78	116	54	88	184	67	60	45	25	126	21	26	37	2096
Other Campus even	260	44	33	18	24	16	33	157	321	218	312	125	159	96	148	161	146	113	105	94	91	53	61	64	2852
Disease event	4427	173	139	99	99	90	151	606	5756	3267	3676	1464	1864	854	984	1190	1384	882	1291	1060	1641	427	395	285	32204
Total	10919	1280	1050	879	652	625	1367	4564	10530	7288	9802	5716	8030	4723	5786	6758	6727	6650	5403	4229	5322	3375	3153	2238	117066

Figure 4.6.7 The main categories and years compared with time (24 hours)



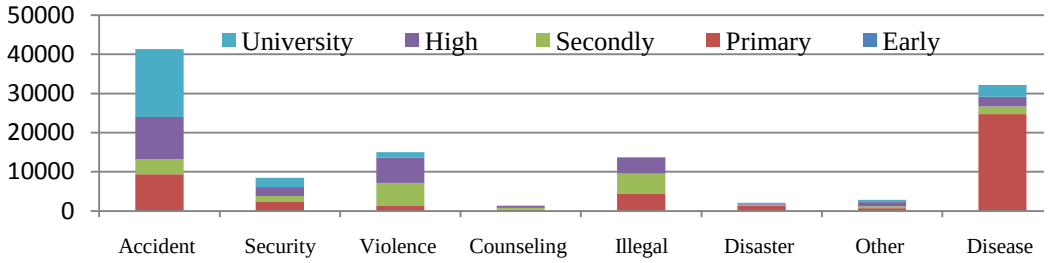
Both the analyses with month and time factors above have demonstrated the recording of events occurs according to a certain rhythm, reflecting the peaks and troughs of activity, periods when there is likely to be more monitoring of activity and so on. Moreover, the participants who are involved in the events may be another main factor shaping the risk record. Consequently, I compared the main categories with different levels of schools (see Table 4.6.13). It is clear that the primary school occupied nearly one-third (44,295 cases) of the proportion, compared with the total number of schools and the highest incidence of event in this educational level was 'disease' event (24,505 cases). Moreover, the high school has ranked the second (27,811 cases) over five year period, and nearly thirty per cent of the events at high school were cause by 'accident' category. Then the third place was taken by university (25,132 cases) (see Figure 4.6.8). It may worth noting that nearly two-third of the proportion was 'accident' at university as well. Finally, the secondary school was located at fourth, both 'violence and deviance behaviour' and 'illegal events for children & teenager (under eighteen)' with a similar proportion, and they contained over half of the percentage at this level of school.

To summarise, the comparison of the eight main categories with the school level showed some significant trends at different levels of school. Indeed, every level of school may get different types of event, which may be influenced by some multiple factors or students' activities, which I explore in the later section during my discussion of the annual report prepared by the CSRC.

Table 4.6.13 Comparison of the main categories with school level

Main-categories / School	kindergarten	Primary school	Secondary school	High school	University	Total
Accident event	48	9334	3826	10767	17356	41331
Security-related event	26	2422	1363	2271	2374	8456
Violence & Deviance behaviour	0	1275	5926	6415	1412	15028
Counseling conflict vent	0	329	458	474	61	1322
Illegal event for children & teenager (under 18)	4	4458	5111	4048	139	13760
Natural Disaster event	5	1281	349	300	161	2096
Other Campus even	1	691	489	1093	576	2850
Disease event	220	24505	1982	2443	3053	32203
Total	304	44295	19504	27811	25132	117046

Figure 4.6.8 The distribution of the main categories with school level



The discussion above highlighted the distribution of the eight main categories of event at different levels of schools from kindergarten to university. Among the numerous campus security events that have been recorded into the system, some relate to injury to students and staff. Therefore, the next comparison data focused on the nature of injury events within the eight main categories (see Table 4.6.14). Table 4.6.14 demonstrates that there were 101,481 cases relating to the injury condition. Broadly speaking, over half percentage of events did not cause injury to the clients, the 58,347 cases were normal and 1,350 cases were missing. However, nearly one-third of the events have caused minor injury to individuals and about five per cent of the cases caused serious injury to clients. Moreover, the 4,153 death have recorded in the database over five years. Otherwise, over 75% of the death cases caused by accident events which arrived 3,193 cases; and the second high proportion of event were followed by disease event which caused 793 deaths.

Incidents of death varied by time and month (see Figure 4.6.9 and 10). As can be seen, on Figure 4.5.9, the highest proportion of the death happened in October (388 cases). The second rank was in May (375 cases) with similar peak as the highest one. The Figure 4.6.10 shows that there were a gradual increased of the death cases from 129 cases, at 8.00a.m., to 214 cases, at 11.00a.m. Then it has decreased significantly to 160 cases at 8.00pm. After that, the number of event rise steadily to the peak with 276 cases in 4.00p.m. Finally, the death cases drop to a second low point with 147 cases at six o'clock in the afternoon.

The diversity of the multiple factors above presents more widely notions of the campus security events which provide some possible trends or patterns for manager's to understand and prevent future reoccurrence of events which appear to have greatest risk of occurrence at certain times of the day and year at particular time. The exploration of

the data also relates to the client's age (see Figure 4.6.11). According to the Figure, the highest proportions of the event occurred at the client age between seventeen and nineteen, and were around 23,000 cases, approximately the end year of high school and the beginning year of the university period. It is worth noticing that the higher event ratio began at age five to seven, and was about 12,000 cases, which is about the first and second year in primary school. After that, the event ratio has decreased gradually until age twelve (10,000 cases). Then the second high point occurred between ages twelve and fourteen which is the first or second year at the secondary school, nearly 17,000 cases. The event ratio then reduces to the age just before seventeen (just over 15,000 cases) a situation in this period time similar to the primary stage.

Table 4.6.14 Comparison of main-categories with the injury condition

Main-categories \ Injury condition	Death	Heavy injury	Minor injury	Normal	Missing	Total
Accident event	3193	4614	22814	9584	36	40241
Violence & Deviance behaviour	107	82	560	4495	52	5296
Counseling conflict vent	29	250	2269	11854	308	14710
Illegal event for children & teenager (under 18)	1	7	188	1054	8	1258
Natural Disaster event	30	59	1261	11192	941	13483
Other Campus even	0	2	0	3	1	6
Disease event	793	159	5366	20165	4	26487
Total	4153	5173	32458	58347	1350	101481

Figure 4.6.9 The proportion of the death rate compared the event with month

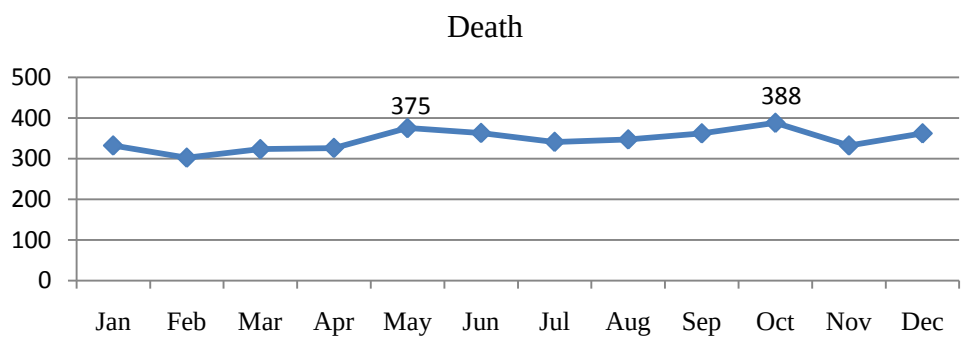


Figure 4.6.10 The proportion of deaths compared with time (24 hours)

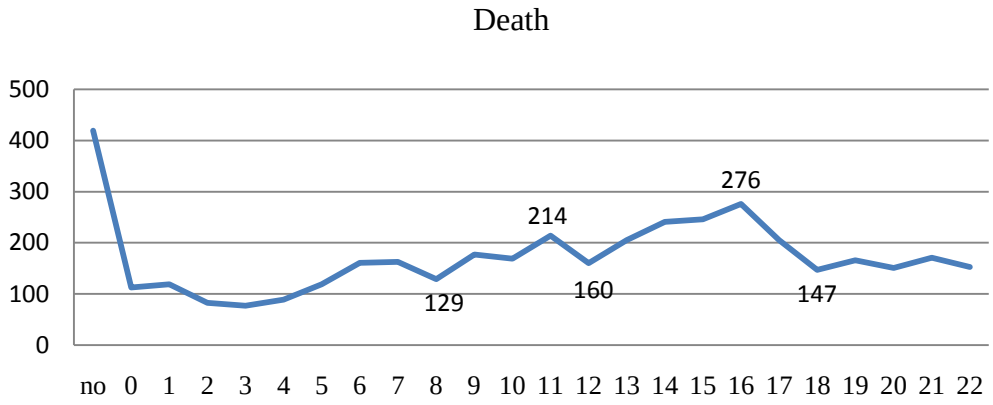
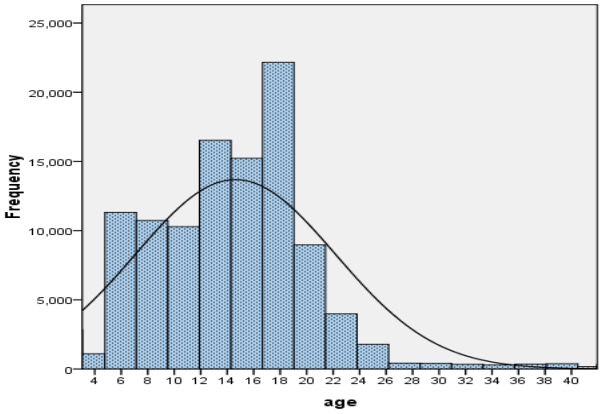


Figure 4.6.11 The distribution of clients' across different age



To conclude, from 2004 to 2008, most of the events in the CSRS were reported as being at C-level, i.e. nearly sixty per cent; the second one was A-level, just over one-third in total. The examination of the proportion with the main categories shows that the category of 'accident' got the highest reporting rate, over thirty per cent, followed by the category of 'disease', nearly one-third of the event. Consequently, the comparison of the data highlights that the highest increase of event was the category of 'illegal event involving children and teenagers (under eighteen)', with a five-fold rise; and the category of 'disease' which saw a tripling in number. Moreover, the distribution of main categories with five years pointed out that 443.64 cases may occur per 100,000 students.

Elsewhere, the analyses of sub-categories presented some specific distribution of events

within each category. For example, in the accident category the highest incidence event was ‘traffic accident out of campus’, over half of the percentage in total; the second one was ‘injury from playing sport or hobby’. Furthermore, the ‘general fight’ event has created the highest percentage in the ‘violent and deviance behaviour’ category; also, some sub-categories may be worth noticing because of their significantly increased ratio, such as the sub-category of “the drugs prevention and cure law”, which showed a domestic increase in the use of illegal drugs by students on/off campus; and the ‘gang violence on campus’ which has also increased ten-fold, suggesting that the campus security events were not only caused by internal students but also by external people from off-campus. Consequently, the category of ‘illegal event involving children and teenagers’ seems a particularly sensitive issue for managers and may well provide a focus for managing risks through moves towards greater social disciplining of behaviour. For example, the ‘sexual assault’ (under eighteen) and ‘sex harassment’ (under eighteen) increased significantly while some sub-categories such as ‘running away from home (for more than) three days’, the ‘high risk family’ and the ‘use of harmful drug’ appear to reflect similar social phenomena and student behaviour; however, normally such factors are out of the control of schools.

Besides, the comparison of main categories with multiple factors, such as region, time, gender and different level of school, demonstrated more diverse trends of event. For instance, the contrast of cities with years highlights that high frequency events may occur in some cities/counties. Counting the total population of students in a city we find some dramatic changes in particular cities. The comparison of gender across the main categories shows that the event rate is higher among males than it is females. Such phenomenon appeared at most of the categories except the ‘illegal event for children and teenager (under eighteen)’. Moreover, the comparison of the main categories with the factor of month presented that the highest event ratio appeared in October and the second peak occurred in June. Consequently, the examination of the categories with the factor of time, during a 24 hour period, demonstrated more specific patterns on each category. For example, the highest peak of the ‘accident’ events appeared at 11.00a.m; the high proportion of the ‘counseling conflict’ event occurred at some particular time, such as one hour before the start of school and one hour after the first class; and most of the ‘illegal events for children & teenager (under eighteen)’ and ‘disease’ events were reported at the start of the school, which is the staring time of school to contact the clients; then the highest proportion of events, in total, appeared at the starting time of

the school from 7-.00-8.00 a.m..

The discussion and exploration above of the data illustrates the ways in which risk-related events are lodged in the system, the patterns of recording and their variance by time, region, or gender and so on. How these are handled was indicated briefly with the various cases I recounted earlier in the Chapter. Together these show the operational functioning of the CSRS, and point to the way managers' reporting is governed by the available categories, and how the latter have also changed over time. The assumption is that by understanding and studying these events the system may provide some experience and guidance for managers to identify possible risk areas and prevent similar events in the future and may supply some simulated situations for students to understand how to avoid potential and similar threats.

The comparison and contrast above of the eight main categories and part sub-categories within the database analysis highlights many possible and significant risks and their trends over time. From a regional point of view, the analysis of data with cities presented a clear sketch of the pattern of events in each city/county which may give managers more information to develop some suitable or useful strategies; such analyses may prevent the event happening within their area of governance. Some significant risky trends have also been discovered related to the time or month and suggest high potential threats of risk across different levels of school. Without this enormous volume of data to support the exploration of risk, any individual campus event may be seen as the tip of an iceberg, with significant trends hidden beneath the surface.

The patterns over the five years period report a number of common features: a growing incidence in the actual number of risk-related events; a change in the relative importance of some types of event – such as the growth in illegal drug use; a highly gendered and to a lesser extent geographically related pattern; and a temporal pattern that relates to the start of the college year and college day. Managers record these events to a system that conveys the information upwards through a hierarchical reporting structure, reflecting both organizational and legal requirements. Clearly, there is an extremely large volume of data being captured here which has to be ordered and structured in such a way as to provide the basis for feedback and more general guidelines to schools and colleges. As Foucault argues, government seeks to deploy its 'power' to manage risk, which may be demonstrated through understanding the design,

development and modification of the CSRS. Such ‘power’ not only allowed the designers to handle any risky event through a management scheme but also gives them the authority to build a disciplined reporting system that maintains some degree of control. Also, this power may build more directions for operators to follow, a good example being the modification of the main and sub-categories and the classification of the three levels of severity of events. The system has built a national network through a directive from the Ministry of Education, which together may be classified as forming an official bureaucratic structure. Both the regulation and direction of the system are shaped by the ‘power’ of the reporting regime on behalf of the Taiwanese government. The main aim of the system is to try to reduce, handle and control every risky event, if the working function of the governance task is to be successful.

It seems that the CSRS has provided the basis for extensive governance and management functions for schools, cities/counties, and improved the transfer time of the information about risks for managers from local schools to governments to handle the vast number of campus events more efficiently. Positively, the system has established a platform for communication between different levels of school and educational management regimes, using the discursive repertoire provided by the categories. However, the discussion so far has been simply about the database in the system and the function of it. If we are keen to look behind the figures an explore the phenomenon of the system’s operational function, one of the possible ways may be to explore the opinion of people using the system now. This is the central concern of the next chapter. In the following section I will discuss some suggestions and reviews found in the annual reports of campus security events which were analyzed by the CSRC, since the exploration of such secondary data may provide us with a sense of how risks are perceived at a general level, and what management responses have emerged.

4.7 Conclusion

The purpose of this chapter is not to produce an analysis of (the extensive) primary data to generate recommendations for policy making, but to explain and show how the system has been designed to function and the trends apparent within the database in the CSRS, established to improve the governance and monitoring of the campus security events around the country. Such a system demonstrated how a hierarchical organization driven by government requirements implements a policy of protection and governance

of large-scale campus security events. The discursive power of risk-management which provides the basis for strong risk governance may constrain a citizen's freedom or create a heavy reporting workload for risk managers, and sometimes have side-effects on risk management itself. Indeed, the CSRS showed the level of management competence in handling the multiple campus events and may also help answer some questions which were discussed in the literature review chapter of my thesis. Firstly, the modification of the main and sub categories for governing the increasing campus events in the CSRS may be evidence of the fact that the scope of risk was sometimes changed by the transition of social activities or sub-cultures such as the cyber crimes or disputed events caused by innovation in technologies. The campus security event categories have been modified several times because of the new types of events created by the change in students' behavior and how this is perceived and registered by those operating the system. For example, the events of 'running away from home' may be caused by students' peer group pressure, one of the youth sub-culture. Some events may be caused by poor domestic relationships or be affected by the friends such as some invisible friends through internet. Some factors may come from the influence of community such as 'gang violence on campuses'. Secondly, the standardization of the risk may be one of the effective ways for hierarchical organizations to manage risk. The managers' capacity with regard to the evaluation and assessment of the risks may be different due to personal experience, ability, and knowledge. The standard regulations and rules which were designed for school managers may help reduce the difference across campuses in managers' performance. As Foucault argues, the establishing of discipline and regulation may empower the government to handle and operate a risk management system in which the management function is top-down in a hierarchical organization. However, as Bijker highlights, through the concept of SCOT, the actual production and interpretive 'work' within such systems and through which they are built is key; this means that it is important to attend to the voices, opinions, experiences and problems encountered by operators, often located at the lower level of management, and an interactive dynamic that is a kind of information feedback through bottom-up links between managers and operators in the organization. This interaction may reinforce, or sometimes challenge, the internal dynamic of a hierarchical culture in managing risk. In respect to the first, the modification of the categories, for example, was a result of interaction between the system managers and the opinion of the operators. The recorded data does not, however, present the manager's personal experience and opinion about

operating the system from their point of view. This is something I explore in detail in Chapters 5 and 6.

More generally, the analysis of the databases presented the dissimilarity of risky trends at different levels of school. As Douglas describes, the relationships of social contexts at the hierarchical organizations are high grid/ high group culture. All the cases in this chapter study were collected from different levels of schools and different geopolitical locations of cities. Such regimes have a similar bureaucratic culture which made it possible to achieve the massive data recording in the system. Without the contribution of managers in different stages of education, the system goals may not be achieved. Examining the CSRS may find that every school has been contained in the same risk management system and regulated by a governance/surveillance culture. The analyses of the reported events demonstrated some possible trends and potential risky conditions. For example, the environmental element may link with the levels of school, the member factor may contain student's age or gender and the regional causes may reflect the dynamic play of sub-cultural differences between rural county and urban city. Nevertheless, comparing the ratio of the total population of students with the number of events we find that the pattern is disproportionate because the event reporting rates of some cities were unexpected when compared with the total population of students in the city. Therefore, it could be a reasonable inference that the reports of campus security events may not fully reflect the actual pattern in those cities/counties. Consequently, some patterns may be worth considering such as the city that reached the highest event report ratio did not get the highest of number of student; otherwise, some city and county had similar event reporting ratio but the number of students were a ten-fold difference, compared the total population of students on both areas. It may be argued that if the discipline in the CSRS becomes established, as Foucault might argue, the reporting ratio should not get a huge difference between rural and urban cities. As Douglas points out, however, the attitude of facing risk may be different from person to person or region to region and this may explain why the different risk patterns are created in those areas. Furthermore, the number of students have decreased across the five years, while the event reporting ratio still has a significant increase year by year, such phenomenon may provide evidence, as Beck highlights, that new type of risks have been created by the innovation of technology in the 'risk society'. Combining the patterns above may explain why it is that although the technology has influenced the

society and culture, the acceptability and so the actual reporting of risk may be different by regional characteristics, local culture, and even local sub-culture.

Evidently, the classification and categories of the campus security events have evolved and adjusted to be what is seen as being comprehensive. As Beck argues, specific rules and institutions are developed and designed to identify and assess risk for citizens. The CSRC relied on information technology to improve the risk management tasks on campus. There is no doubt that the CSRS has acted to support the government to govern risk events. However, it is unavoidable that new types of campus security events will happen with the ongoing innovation of modern technologies, which may influence educational institutions and society as well. Inescapably, risk management systems have to be modified and the operational functions and regulations have to be regulated to help enhance operators' ability in dealing with the varied campus events. Therefore, the experience in dealing with campus security events may provide important lessons for newcomers to this field of work.

Approaching the issue from a SCOT perspective (Bijker and Pinch, 1990), we can argue that the modification and evolution of the CSRS tries to solve perceived problems identified by different groups, reported by the school operators and found in the annual analyses of the database, to achieve the functions of the CSRS and to prevent some invisible and potential events for risk management. The annual reports not only pointed out potential threats from the historical record data but also supported some useful information that may reduce possible campus security events in the future. In theory, this task of researching the historical event should reduce the likelihood of events because it may help people to understand the risk; however, in practice, the event still happens frequently, as found through the data analysis. Studying the annual reports one sees comment on similar types of events at different level of school and the potential threats at specific times, and they also provide a similar type of analysis and repeat reviews and recommendations across the five years. Therefore, the function of the annual report may appear to be one of a standard procedural task for the hierarchical organization. Consequently, it is important to go beyond the reports and to explore the interaction between managers and schools and the sub-cultural dynamic at work within the school.

From the SCOT point of view, the discovery of operator's opinion and views on the system should provide important information on the framing of risk. Consequently, some questions arise after this exploration of the database provided in this chapter. What is the operator's personal experience and opinion in regard to operating the CSRS? What is the manager's opinion about the dynamic of organizational culture through which the management of risk events occurs? What is the manager's feeling and experience when facing or after dealing with the campus security events? Both the discussion of the system database and the annual reports above was based on information recorded by those actors working within Taiwan's educational system. From the CSRS perspective, the data is a simple automatic log of risks that reflect rising trends in various forms of danger. But, how such events and risks actually enter the system is far from automatic. Therefore, I have designed a questionnaire for collecting my second primary data based on the personal opinions of people who operate the system at school, focusing on the manager's viewpoints directly. So the following Chapter moves on to the discussion on the managers' opinions about operating the CSRS within Taiwan's high schools.

Chapter 5: Using the CSRS: managing risk

5.1 Introduction

The previous chapter explained the development and background of the CSRS, and provided an analysis of the pattern of risk as reflected in the database and its changes over time; I also discussed the annual reports published by the CSRC and how these can be seen as both functional and symbolic policy documents. As described before, the huge volume of data recorded in the system, which demonstrates the comprehensive and extensive reporting of events at schools and colleges, was produced by the system operators around the country. As a digital system, its design, subsequent development and use will reflect diverse interests and needs, a point noted generally within the SCOT approach (see Bijker 1989: 35). Different social groups may come into conflict because the framing and utility of the technology are influenced by the personal experience, needs or the knowledge of users. Eventually, a technical system may evolve and stabilize through discussion of the system's function and the solution it provides to questions that arise, as well as questions caused by the system, with different interests shaping problems and how they should be resolved.

The purpose of this chapter is to focus attention on the operators' opinions and whether they have similar or differing views about the design and utility of the system; these participants are responsible for the management or operation of the system and they have to deal with campus security events at school. As described in the methodology chapter, in Taiwan, there is a group of special staff working in the educational system who come from the Ministry of National Defence: their responsibility relates to the governance of campus security and the instruction of students in the concept of military and national security. Some of the staff originally worked in the military then transferred from there to the education system, others were recruited after they had graduated from university. According to the Ministry of Education, there were around 3,700 military staff working at 161 Universities (including Colleges) and 487 high schools around the country in 2009. As can be seen, one of the responsibilities of these staff is to operate the CSRS.

The chapter is divided into four sections and a closing summary. The first part describes the characteristics of participants, presenting their background and role. The second section explains the design of the questionnaire and the basic description of the

demographic profile of the respondents. The third section focuses on the respondents' opinions relating in broad terms to the management of risk, captured through the main items on the questionnaire. The fourth section explores some questions and responses in more depth to illustrate some specific patterns identified from respondents' answers. The fifth and final section provides a summary and the conclusions of the chapter.

5.2 The managers' backgrounds and the survey sample

The function of CSRS is built on an information technology (IT) system designed to serve the education system; its concept was constructed on the basis of a command and control relationship between the education system and the national disaster management centre. As described in the methodology chapter, the structure of the system contained three management levels, from central government to local government then to schools. This is clearly a hierarchical set of relations and in Douglas and Wildavsky's (1982) terms has a strong 'grid' characteristic. What is of interest in this chapter is whether this is also reflected in the perceptions of risk among the users, and their assessments of the system. This may vary by position and length of time using the system, so, as I show later, one way to understand the real situation of the actors' concept of risk within the educational system is to explore their views after they have had some experience of using the system.

As I noted in the methodology chapter, my thesis focuses on 393 high schools, which are managed by the Taiwan Province, and the integration and command structure within the whole educational administrative system suggests a high/grid and high/group form of bureaucratic culture. According to the Department of Education in Taiwan Province, there are approximately 2,013 staff assigned to manage and operate this system in those high schools. The purpose of this chapter is to understand the users' attitudes through the quantitative data collected by a questionnaire. As noted above, the participants have worked in a highly bureaucratic culture. Thus, before I sent out the questionnaire and started the quantitative data collection, I visited the head of the Military Office at the Department of Education in Taiwan Province, which is responsible for managing 393 high schools that formed the focus for my survey, not only to explain the goals of my research but also to show an authorization document which provided evidence that the CSRS had approved my research. By doing so, my fieldwork for the data collection was more acceptable and likely to get a higher return. Each year a training schedule set by

the Department of Education in Taiwan Province brings high school staff together. I used the opportunity in July 2009 to attend this national training conference which brought together around 1,150 staff and which provided me with a chance to collect the quantitative data. Consequently, the questionnaires were sent out during three series of annual staff training conferences between the 15th July and 24th July, in 2009. This sample population is, therefore, drawn from the people who participated in the training conferences, which comprises just over half of the total population of staff at the national level.

Eventually, the questionnaires were sent out to 359, 398 and 397 groups of respondents respectively during the three training conferences. There were 1,154 questionnaire copies delivered and 1,055 returned in total. The proportion of questionnaires returned was, therefore, about 91%. After examining the returned questionnaires, there were 923 responses seen as valid and 132 invalid responses within the 1,055 returned copies. The 923 valid questionnaires were then rechecked in terms of the detail of response to the range of questions: some respondents agreed with every item which I decided seemed to be doubtful and simply an automatic 'box-ticking' of replies. I discounted these which left me with 805 to analyse in total.

5.3 The questionnaire design and distribution of the survey

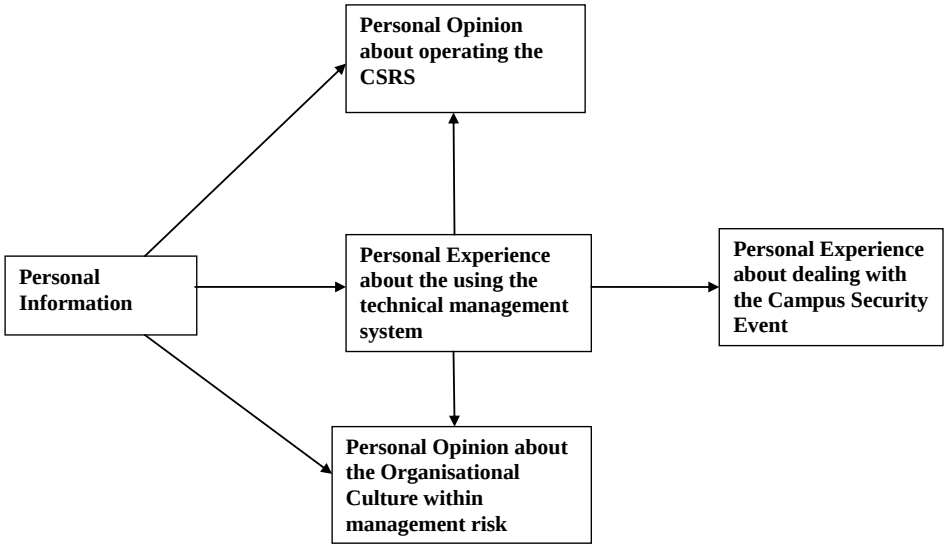
As noted earlier, a pilot of the questionnaire used to collect the quantitative data had been completed before the actual survey. In this section I will focus on two points, the measurement of research and the questionnaire design, to explain the quantitative element of the fieldwork. Before the discussion of the survey data, I will discuss the concept of research design and the function of measurement, focusing on the questionnaire and the measurement targets of the survey. Then the discussion will move onto the basic distribution of the survey results themselves.

5.3.1 The questionnaire design

As described in the methodology chapter, the research method used to collect the quantitative data was a questionnaire given to operators/managers of the CSRS. Generally speaking, five main variables were taken into account in the design of the questionnaire; the first variable relates to the participants' background and personal characteristics, the second to the respondents' experience of using the technical

management system. The survey then addressed their perceptions about operating the system. Following this, the focus moved onto their personal opinion about the organisational culture and risk management. The final topic explored personal experience in dealing with campus security events. I try to explore the causal links between each variable; and the basic concept of my research design and the comparative process is shown below (see Figure 5.3.1.1). In the following section I will provide detail on each main variable as they appear in the questionnaire.

Figure 5.3.1.1 The correlation explored between the main variables



According to the Figure above, the first main variable focuses on participants' personal information which has itself been divided into nine sub-variables. The questionnaire asked participants to tick a code from each variable, which identified the managers' background. The operational definitions of nine variables are outlined below.

A. Basic information

1. Rank:

   This identified the military rank of a participant, divided into four groups: Lieutenant, Captain, Major and Lieutenant Colonel.

2. Gender:

   The participant's gender: Male or Female.

3. Job position in department:

   The participants' current positions and their period of service at school:

   There were four options： General staff (under 2 years), General staff (over and include 2 years), Supervisor of Department and Head of Department.

4. Type of school the respondent working in now:

   The type of school which a participant served in; there were four options: General High School, Vocational High School, Complete School and Liaison Office [city/county management centre].

5. The time respondents have been working in the Military Training Office:

   The time which the participant have been working at the MTO, there were four options：under 2 years, 2 to under 5 years, 5 to under 10 years and over 10 years.

6. The time respondents have been working at the current school:

   The time which the participants have been working at the current school, there were four options：Under 2 years, 2 to under 5 years, 5 to under 10 years and over 10 years

7. Academic Qualification:

   The participants' academic degree - including University/College, Master and PhD.

8. Military Training Background:

   Participants' military training background, according to their military training level, including Basic training, Intermediate training, Advanced commander training and 'Summit' training.

9. The respondents' current role in the campus security at school:

   This asked the participants if their current jobs related to campus security management.

The second section related to participants' personal experience of using the technical management system. Participants were asked to tick either yes or no box to each question (see Table 5.3.1.1). The actual questions appear below:

Table 5.3.1.1 The personal experience of using the technical management system

The focus of the question
10. Have you had any experience of operating any other similar systems elsewhere before operating this system?
11. Was that similar security report system used in the military?
12. Did you receive any training from school before you first operated this system?
13. Did you receive any information about why the Minister of Education designed this system?
14. Did you receive any analysis report or result about 'campus accident events' from the Minister of Education?

After the collection of this objective information, the next three sections focus on satisfaction in regard to operating the CSRS, to capture wider subjective perspectives from the operators' viewpoints, including personal attitudes about the experience of operating this system, viewpoints relating to the risk management process within the

organizational culture, and personal experience of dealing with the campus security events. This range of data was collected using a closed-ended questionnaire and Likert scale.

The first part of this section focused on participants' opinions about some processes and concepts of operating the CSRS (see Table 5.3.1.2). Generally speaking, in this section I tried to explore the participants' opinion about operating the system to determine whether there were any problems using the technical system.

Table 5.3.1.2 Personal opinions about operating the CSRS

The focus of the question
15. Do you think that the reporting procedures are simple and easy to follow?
16. This system is effective for schools to manage risk events.
17. This system provides a good communication channel in managing risk for the education system.
18. Student security is more important than studying at school.
19. The operating training provides enough knowledge for you to operate this system.
20. The classifications of the event in the system are clear and include every sort of event.
21. The system categories may change because of the interest in some events from the media

I then explored operators' views on managing risk through the organisational culture (see Table 5.3.1.3). Here I was interested in asking about managing risk events on campus including issues about the obligations of the school, dealing with risk, opinions on personal privacy, historical data analysis and the surveillance of schools by the Ministry of Education. The later questions sought more critical views among the participants' about their organizations and where the boundaries between privacy and school reputation lie.

Table 5.3.1.3 Personal opinion about the organisational culture

The focus of the question
22. A school has an obligation to deal with any events which happen to students and staffs
23. A school has an obligation to protect personal privacy when accidents happen to students or staff
24. This system may invade students' or staffs' privacy when transferring personal information
25. Asking a school to report an accident is one of the functions of surveillance for the Minister of Education to monitor schools
26. It is a school's obligation to anticipate and prevent other accidents with the help of historical database analysis
27. It is an obligation of the Minister of Education to analyze the historical database
28. Sharing information about campus security events which happened at other schools could help a school prevent similar events
29. To protect the reputation of a school, sometimes the administrative manager may temporarily withhold information about specific events
30. Reporting school accident events may make colleagues hostile towards you because this may be seen as being too ready to please management

The final section (see Table 5.3.1.4), was designed to collect respondents' experience of managing or dealing with campus events. This concluded with a multi-choice question

designed at the end of the questionnaire, asking the participants to choose high-frequency accidents they had met before from eight main categories.

Table 5.3.1.4 Personal experience about campus security events

The focus of the question
31. Accident events usually happen to particular types or groups of student
32. Schools should notify the client that the event will be sent to the Campus Security Centre when dealing with the even
33. Schools should notify the clients' legal guidance immediately when dealing with the event
34. Client and his legal guardians have the right to know how a school reports the event
35. Sporadic events which involve multiple-factors such as 'food poisoning' are hard to control
36. Some events happen with high frequency such as 'car accidents', so they are hard to reduce
37. Latent [potential or unknowable]events such as 'suicide' are hard to anticipate and to manage
38. While technology may help with risk event management, sometimes it also causes some new problems, for instance: recording counselling conflict events with mobile phones, posting an unwanted video on the internet or sending an e-mail to the minister of the Ministry of Education etc
39. According to your experience from the past, which event(s) were more common in your school? (Multi-choice)

Having outlined the structure and logic of the survey I now move on to the description of the basic distribution of the actual survey results.

5.3.2 The distribution of the survey

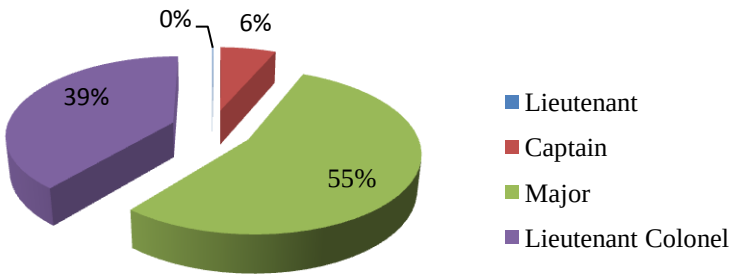
As I discussed in the previous section, after double checking the survey results, the return rate of the questionnaire was around ninety per cent and the valid respondents were 805. In this section I will explore some basic results of the survey, including the distribution of respondents with their background such as rank, position in department, working time at school and educational qualification, and the four sections of the questionnaire, including the proportion of respondents' experience of using the technical management system, the perspective on operating the system, attitudes towards risk management in relation to the wider organizational culture and their personal attitude towards the campus security event itself.

5.3.2.1 Basic characteristics of the respondents

The respondents for this quantitative research were managers who operate the CSRS in high schools. The first set of questions, therefore, were used to classify the participants' background, including senior/junior staff which may present by military rank and position in the department and other characteristics such as whether the respondent is a junior or senior staff member and the educational qualification they hold. The first variable is the rank of respondent (see Figure 5.3.2.1). As can be seen, the highest

proportion is major, compared with other ranks, more than 50% in total (439 respondents [54.4 %]). What follow in sequence are the rank of lieutenant colonel (314 respondents, 39 %), the rank of captain (51 respondents, 6.3 %) and the rank of lieutenant which only related to one respondent.

Figure 5.3.2.1 The distribution of the rank of respondents



In terms of the variable of gender (see Figure 5.3.2.2), most of the respondents are male, nearly three quarters in total (595 respondents), with females being just over a quarter of participants (210 respondents). The third variable is the position of the participant which was sequenced by their working time and roles at school (see Figure 5.3.2.3). There were 326 general staff (over 40 %) working for over (and including) two years, 194 supervisors of department (24.1 %), 153 general staff (19 %) working for less than two years and 132 heads of department (16.4 %).

Figure 5.3.2.2 The gender distribution of respondents

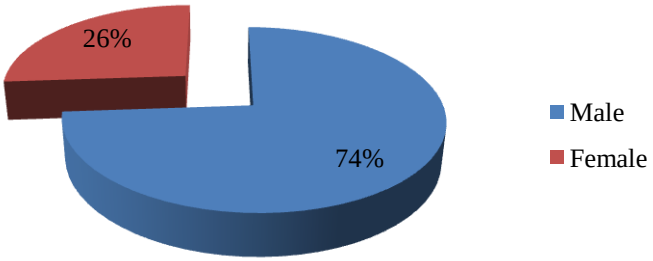
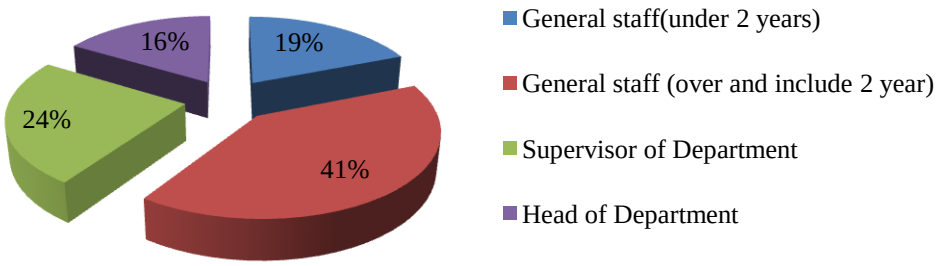
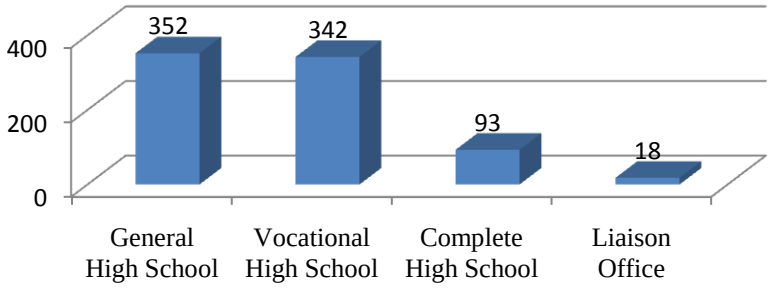


Figure 5.3.2.3 The distribution of the respondents' position in the department



A fourth variable presented the working place of the respondents (see Figure 5.3.2.4). In Taiwan, there are three types of high school: general high schools, vocational schools and 'complete high schools' [students from year 7 to year 12]. Both general high schools and vocational schools had a similar proportion: 352 respondents (43.7 %) and 342 respondents (42.5 %) respectively, with only 93 respondents from complete schools (11.6 %). There were 18 respondents working at liaison office as the managers at the city/county level.

Figure 5.3.2.4 The distribution of the respondents' working place



The fifth and sixth variables related to the working time at the Military Training Office (MTO) and at the current school. Broadly speaking, nearly 40 % of respondents (306 participants) have worked at MOT over five years and less than ten years; then managers working for over two years to less than five years ranked the second (198 respondents 24.6 % (see Figure 5.3.2.5). In terms of time worked at the school, most of the respondents had been there for less than two years (373 respondents, 46.3 %), and the proportion of participants reduced gradually with the increasing of working time at the current school (see Figure 5.3.2.6).

Figure 5.3.2.5 The distribution of the respondents' working time at MTO

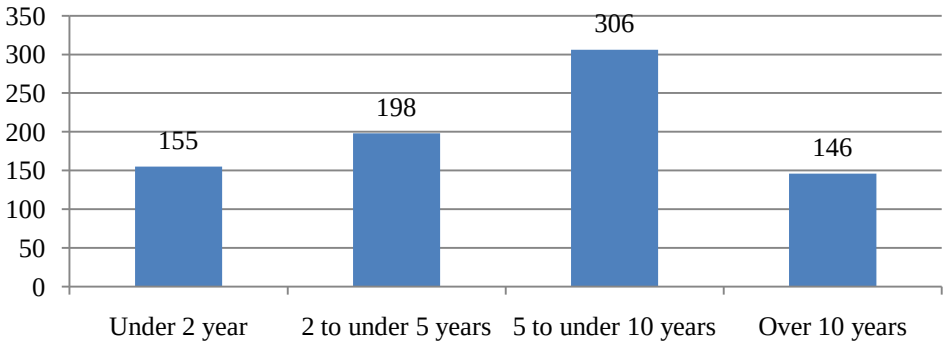
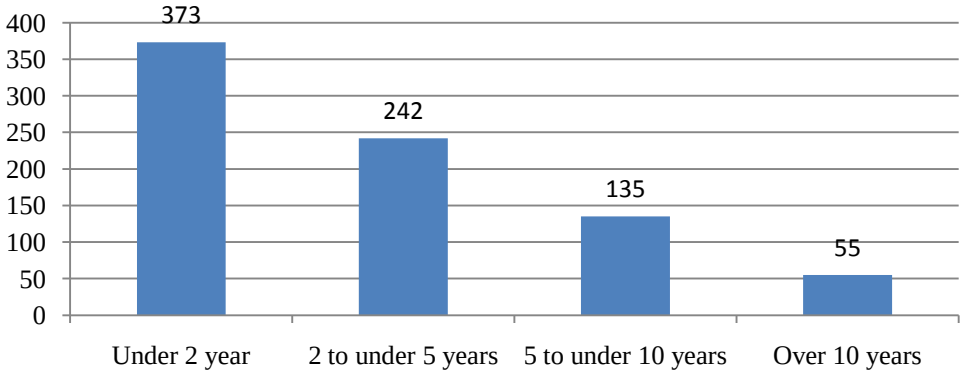


Figure 5.3.2.6 The distribution of the respondents' working time at current school



In terms of academic and military qualifications, most of the participants had university qualifications (620 respondents, 77 %); and 185 participants had masters qualifications (23 %) (see Figure 5.3.2.7). In terms of their level of military training, the majority had achieved intermediate commander training (see Figure 5.3.2.8). The final variable focused on their current job. It can be found that around 53 % (427 participants) of participant were responsible for campus security, and 47 % (378 participants) were not (see Figure 5.3.2.9).

Figure 5.3.2.7 The distribution of the respondents' academic qualification

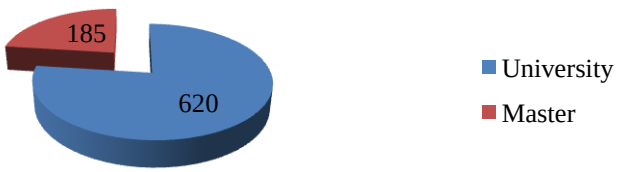


Figure 5.3.2.8 The distribution of the respondents' military training background

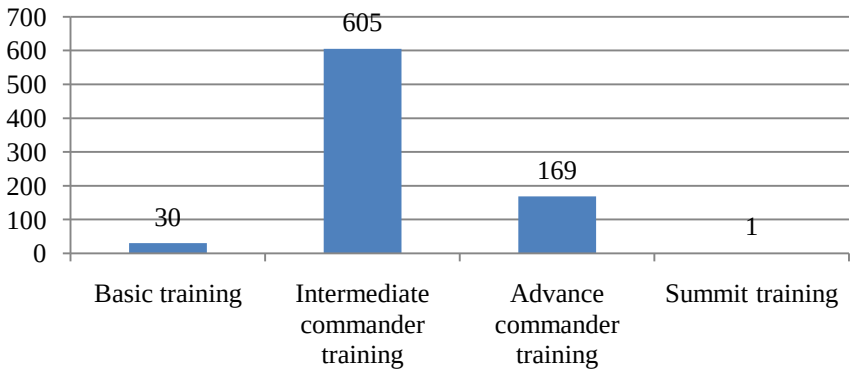
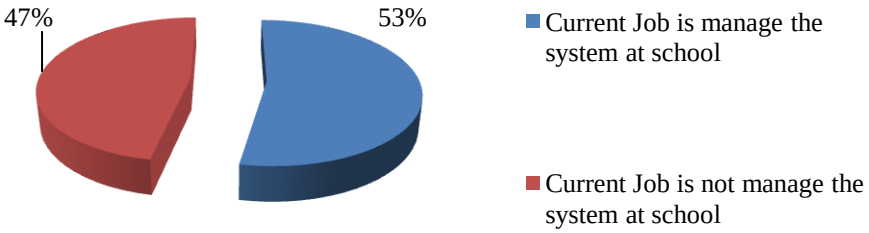


Figure 5.3.2.9 The distribution of the respondents' current job in management campus security



In summary, as Table 5.3.2.1 shows, some key demographic characteristics are that the majority held university degrees and over half of the sample population occupied the rank of major; most of these are men, and over forty per cent of the respondents are general staff working for over two years at their current school. A significant minority (c. 40%) of the respondents worked at the MTO for between five years and ten years, and three quarters of the population took the intermediate commander training in the military. Finally, over half of the respondents are responsible for the operation of the campus security system within their current work role.

Table 5.3.2.1 The demographic background of respondents N=805

Personal Information		Number	%
1.Rank	Lieutenant	1	0.1
	Captain	51	6.3
	Major	439	54.4
	Lieutenant Colonel	314	39
2.Gender	Male	595	73.9
	Female	210	26.1
3.Position in Department	General staff(under 2 years)	153	19.0
	General staff (over and include 2 year)	326	40.5
	Supervisor of Department	194	24.1
	Head of Department	132	16.4
4.Work Place	General High School	352	43.7
	Vocational High School	342	42.5
	Complete High School	93	11.6
	Liaison Office	18	2.2
5.Period of Time working at Military Training Office	under 2 year	155	19.3
	2 to under 5 years	198	24.6
	5 to under 10 years	306	38.0
	over 10 years	146	18.1
6. Period of Time working at current school	under 2 year	373	46.3
	2 to under 5 years	242	30.1
	5 to under 10 years	135	16.8
	over 10 years	55	6.8
7. Academic Qualification	University	620	77.0
	Master	185	23.0
	PhD	0	0
8.Military Background	Basic training	30	3.7
	Intermediate commander training	605	75.2
	Advance commander training	169	21.0
	Summit training	1	0.1
9.Current Job in Campus security	Yes	427	53.0
	No	378	47.0

5.3.2.2 Personal experience of using the technical system

The discussion above presented the respondents' personal background, working time and educational and other qualifications; in this section I will explore their experience of using the technical system (see Table 5.3.2.2). The first question focused on whether respondents had experience of operating similar management systems before. According to the Table, nearly seventy per cent of respondents had had a similar experience before, some in military settings, whereas the remainder did not. Most respondents had received training before they operated the system (nearly 70 %), though around a third did not get the training practice before using the system.

I also wanted to explore respondents' knowledge of the development of the CSRS. Thus one question asked the participants if they had any information about the reason the CSRS was designed in the first place. Most of the respondents (over 80%) did, and most also received information about the annual reports prepared by the CSRC.

Table 5.3.2.2 The distribution of personal experience with the CSRS N=805

	Yes (%)	No (%)	No Answer
Have experience of operating other similar systems	556(69.1)	247(30.7)	2(0.2)
Was that similar security report system used in the military	150(18.6)	453(56.3)	202(25.1)
Get any training from school before first operated this system	545(67.7)	249(30.9)	11(1.4)
Get information about the Minister of Education designed this system	650(80.7)	155(19.3)	0
Get analysis report/ result from the Ministry of Education	599(74.4)	206(25.6)	0

Having examined some aspects of the respondents' personal experience of using the technical system, I then sought their responses about procedures, effectiveness and training in the technical aspects of the system. The data is reported below in Table 5.3.2.3.

Table 5.3.2.3 Views about the operation of the CSRS N=805

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Mean	SD
The reporting procedures are simple and easy to follow	79(9.8)	533(66.2)	116(14.4)	71(8.8)	6(0.7)	3.76	0.777
System is effective for schools to manage risk events	83(10.3)	421(52.3)	200(24.8)	80(9.9)	21(2.6)	3.58	0.898
System provides a good communication channel in managing risk for the education system	117(14.5)	496(61.6)	130(16.1)	50(6.2)	12(1.5)	3.81	0.810
Student security is more important than studying at school	278(34.5)	462(57.4)	58(7.2)	7(0.9)	0	4.26	0.622
Operating training provides enough knowledge for you to operate this system	93(11.6)	560(69.6)	117(14.5)	35(4.3)	0	3.88	0.649
Classifications of the event in the system are clear and include every event	70(8.7)	503(62.5)	166(20.6)	61(7.6)	5(0.6)	3.71	0.754
System may change because of the interest in some events from the media	141(17.5)	489(60.7)	136(16.9)	34(4.2)	5(0.6)	3.90	0.748

Across the range of questions, it is clear that most of the responses are positive more than negative. Generally speaking, around sixty to seventy percent of the participants agreed that the systems operating procedure is simple (M=3.76; SD= 0.777), and they believed that it can provide an effective management function (M= 3.58; SD= 0.898) and communication channel for schools to manage risk events (M= 3.81; SD=0.81). However, around ten per cent of the respondents questioned the functionality of the system and showed a negative attitude to the task of risk management.

Most of the respondents (over 90%) agreed that student security is more important than study and learn knowledge when they arrived and stay at school, that operator training provides enough knowledge to operate the system and that the classification of events is clear, with their main value and standard deviation as M= 4.26; SD= 0.622, and M=

3.88; SD= 0.649 respectively. Moreover, most of the respondents agree that the system classifications are clear and include most events (M=3.71; SD=0.754); and they felt that the media could have an effect on reporting levels (M= 3.90; SD= 0.748).

In summary, it can be seen that answers showed a more positive than negative attitude in response to this set of questions. As a bureaucratic institution, the CSRS tries to build a standard operational procedure for the management of risks, though this was seen to be subject to disruption at times if the media reporting of risk required new categories to be put in place. The broad picture is of a system that requires quite high levels of conformity to reporting procedures, and that these appear to 'make sense' for most respondents. It was important to ask more generally about the relationship between these views and opinions about the wider organizational culture in regard to expectations about reporting and privacy, and the obligation of the school to oversee risk management itself (see Table 5.3.2.4). On both fronts, the majority view privacy/confidentiality and risk management as the prime responsibility of the school (M= 4.25; SD= 0.606) and (M= 4.43; SD= 0.539) respectively.

However, as Table 5.3.2.4 below shows, it was also the case that most respondents agreed that personal privacy may be invaded when information was transferred through the system (M=3.54; SD=0.906). It is interesting to note that over forty per cent of the participants believe that one of the legitimate functions of the CSRS is to monitor the school and, yet in this regard, monitoring for many did not equate with surveillance or supervision of the school by the MOE (M=3.26; SD=0.988).

Monitoring raises more strategic issues in regard to its longer-term value in the sense of providing data on which future action can be taken: here most felt that schools are under the obligation to prevent other events through the help of an analysis of the historical database (M= 4.00; SD= 0.623), as is also the case with the MOE (M= 3.84; SD= 0.722). In short, most of the managers consider that educational institutions have an obligation to prevent the potential for accidents through lessons learned from the database, not surprisingly therefore, nearly ninety per cent of the participants agreed with the position that sharing security event information is legitimate and would help prevent similar events occurring in the future (M=4.03; SD=0.643).

At the same time, there is evidence that respondents regarded protecting the school's reputation as equally important inasmuch since over 50% of the sample agreed with the

view that in some contexts managers temporarily withhold information about a specific event in order to protect the school's standing in the wider public domain (M=3.40; SD=1.012). The question of reporting events or withholding news of them is however also complicated by other data here which shows that about thirty per cent of respondents felt that their colleagues may become hostile towards them for reporting on risks, though around similar proportion of respondents likely to trigger this was not indicated (M=2.89; SD=1.02).

Table 5.3.2.4 Perspectives on the organisational management culture

N=805

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Mean	SD
A school has an obligation to deal with any events	257(31.9)	501(62.2)	37(4.6)	8(1.0)	2(0.2)	4.25	0.606
School has an obligation to protect personal privacy	366(45.5)	423(52.5)	15(1.9)	1(0.1)	0	4.43	0.539
The system may invade students'/staffs' privacy when transferring personal information	83(10.3)	406(50.4)	185(23.0)	123(15.3)	8(1.0)	3.54	0.906
Reporting an accident is one of the functions of surveillance to monitor schools	76(9.4)	281(34.9)	239(29.7)	194(24.1)	15(1.9)	3.26	0.988
School has obligation to anticipate and prevent other accidents with the help of historical database analysis	138(17.1)	540(67.1)	113(14.0)	13(1.6)	1(0.1)	4.00	0.623
The Ministry of Education has an obligation to analyze the historical database	126(15.7)	458(56.9)	192(23.9)	28(3.5)	1(0.1)	3.84	0.722
Sharing information about campus security events could help prevent similar events	152(18.9)	548(68.1)	83(10.3)	20(2.5)	2(0.2)	4.03	0.643
Protecting a school's reputation, the administrative manager may withhold specific events	79(9.8)	374(46.5)	172(21.4)	152(18.9)	28(3.5)	3.40	1.012
Reporting events may make colleagues hostile towards you	50(6.2)	186(23.1)	238(29.6)	288(35.8)	43(5.3)	2.89	1.020

To conclude, in regard to a schools' obligation to deal with any risk-events, protecting personal privacy, anticipating/preventing other events, analyzing the historical database and sharing the event information with other schools, most of the participants present positive opinions. However, nearly half of population believed that one of the functions of the system is to monitor the school for the higher educational regime, and a similar proportion also pointed out that for protecting a school's reputation sometimes the administrative managers may temporarily withhold information about some specific events. Here *risk management* is linked to *reputational management* and suggests an organisational culture whose practices are both hierarchical and sensitive to the

public-facing status of the educational systems as a whole. I will try to explore these issues through my qualitative interview data in the next chapter.

5.3.2.3 Personal experience in dealing with campus security events

In regard to actual events (see Table 5.3.2.5 below), the risk-reporting pattern (as we saw in Chapter 4) reflects a high rate of 'accidents' within the broad range of categories available. As can be seen, nearly half of the participants confirm this in respect to their own experience, and note that accidents usually happen to particular types/groups of student (M= 3.17; SD= 1.025) and most of the respondents agreed with the statement that the school should notify the client (the student/parent) that information about the incident should be sent to the CSRC (M=3.2; SD= 0.993).

Table 5.3.2.5 Personal experience/reporting about campus security events

N=805

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Mean	SD
Accident events usually happen to particular types or groups of student	44(5.5)	355(44.1)	112(13.9)	280(34.8)	14(1.7)	3.17	1.025
Schools should notify the client the event will be sent to the Campus Security Centre when dealing with the even	49(6.1)	315(39.1)	222(27.6)	187(23.2)	32(4.0)	3.20	0.993
Schools should notify the clients' legal guidance immediately when dealing with the event	275(34.2)	468(58.1)	39(4.8)	20(2.5)	3(0.4)	4.23	0.685
Client and his legal guardians have the right to know how a school reports the event	198(24.6)	507(63.0)	76(9.4)	23(2.9)	1(0.1)	4.09	0.677
Sporadic events which involve multiple-factors such as 'food poisoning' are hard to control	119(14.8)	474(58.9)	111(13.8)	95(11.8)	6(0.7)	3.75	0.874
Some events happen with high frequency such as 'car accidents', so they are hard to reduce	69(8.6)	328(40.7)	162(20.1)	231(28.7)	15(1.9)	3.25	1.024
Latent events such as 'suicide' are hard to anticipate and to manage.	68(8.4)	315(39.1)	162(20.1)	246(30.6)	14(1.7)	3.22	1.028
Technology may help with risk event management, sometimes it also causes some new problems	270(33.5)	426(52.9)	81(10.1)	25(3.1)	3(0.4)	4.16	0.754

Most of the participants, around ninety per cent, agreed that a school should notify clients in regard to any legal guidance they might need (M=4.23; SD=0.685) and clients have the right to know how the school reported the event to the CSRC (M=4.09; SD=0.677); just a few participants took a dissenting view from this. I also asked about their experience of types of event such as sporadic, high frequency and latent events

(M= 3.75; SD= 0.874; M=3.25; SD=1.024 M=3.22; SD=1.028 respectively). Generally speaking, nearly three quarters of the participants believe that sporadic events involve multiple-factors so they are hard to control as are 'latent' (potential) events. Also, around half of the participants agreed that it is hard to reduce the incidence of some events that have a high frequency, though it is interesting to see that nearly thirty per cent of participants challenge this view. Consequently, there are around four in five of the participants believe that risk may accompany the using of technology itself (M=4.16; SD= 0.754).

Finally, the last question was designed as multiple-choice question to conclude the participants' experience of dealing with common events (see Table 5.3.2.6), primarily the eight main categories according to the CSRS. It can be seen that the highest incidence event was 'accident' (86.3 %), followed by 'violence and deviant behaviour' (57.5 %), 'counselling and conflict' events (37.5 %), security (29.7 %), disease (28.9 %), 'illegal' events relating to children and teenagers (27.6 %), 'natural' events (7.8 %) and 'other' campus security events (6.3 %). Generally speaking, the report on their experience of recording and handling risk-events is similar to the analysis of recorded data in the CSRS which I discussed in the last chapter.

Table 5.3.2.6 The frequency of personal experience of events (Multi-choice)

N=805

Accident Event	695(86.3)	Illegal Event for Children & Teenager	222(27.6)
Secure Preserve Event	239(29.7)	Natural Disaster Event	63(7.8)
Violence & Deviance Behavior	463(57.5)	Other Campus Event	51(6.3)
Counselling & Conflict Event	302(37.5)	Disease Event	233(28.9)

In summary, this section has presented the basic data from the survey. In broad terms it appears that there is a general consensus that the system 'works' and that it is broadly functional and useful. There are though some issues thrown up by the data in regard to such matters as privacy, surveillance and proper and legitimate levels of monitoring and reporting that are worth examining more closely. In this next section, I adopt a different approach and cluster and compare responses across such themes in more integrative ways.

5.4 Comparison of respondents' specific opinions

The exploration above considered the main findings of the survey and managers' opinions about operating and managing the CSRS. The results provide several clues as

to how to manage risk more effectively and improve the prediction and prevention of future events; however, they were from analyses of only one independent variable, which simply presents the basic distribution of results with respect to a single issue. In order to get a better understanding of the operators using and managing the system and how their backgrounds reflect their broader opinions, it is necessary to compare the data across two or three independent variables. In this section, therefore, I will examine the respondents' opinions by comparing multiple factors across two or more variables and the statistical results of an independent t-test, complemented by one-way analysis of variance (ANOVA).

The t-test and ANOVA will be used here to compare participants' attitudes towards the system with multiple variables and to distinguish respondents' opinions with regard to different issues. Brace *et al*. point out that the statistical function of an independent t-test and one way analysis of variance ANOVA can be effective ways to compare two or more independent groups of individuals (Brace et al. 2009: 127). I will thus examine respondents' perceptions, particularly regarding levels of satisfaction with three discrete but key issues.

5.4.1 The measurement of independent t-test with respondents' opinions about the operation of the CSRS

The measurement task of this section will focus on the variables that include two groups of individuals, selected according to gender (Male/Female), academic qualification (University/Master degree) and the respondents' current role (whether the participant responses for managing the system at their current school). These variables each involve just two nominal sub-variables; the independent t-test task is applied to identify the difference between both sub-variables. Before doing this analysis, I would like to repeat that the Likert scale, five points on a spectrum from positive to negative, was adopted in the questionnaire to evaluate participants' attitudes, the numbers from 5 to 1 corresponding with approval to disapproval.

The first task is to examine participants' satisfaction with the operating system (see Table 5.4.1.1). Responses fall mainly into two categories, one relating to issues about the broad efficacy and utility of the system, the other the relationship of the system to the wider organizational culture and needs of the school/college in which it is based. The first independent variable, shown in the top row of Table 5.4.1.1, can be used to

compare participants' attitudes towards operating the system according to gender and it can be seen that only in respect to the question about the perceived clarity of the classification system and whether it includes every event do we see any statistical significance ($t = 2.371$; $p<0.05$) between male and female staff. Also, it is interesting to note that the mean values show male managers are more satisfied with the operation of the system than female managers, except over the question of whether student security is more important than studying at school, women being more likely than men to agree with this.

Moving on to participants' personal opinions about operating the system measured against the variable of academic qualification, shown in the middle row of the table, there are three statistically significant results to questions relating to the effectiveness of the system for a school in managing risk ($t=1.668$; $p<0.05$), in acting as a good communication channel ($t=2.779$; $p<0.001$) and whether there is adequate training for operators to use the system ($t=1.668$; $p<0.05$). More generally it is clear that participants with a Master's qualification are less satisfied with the system than managers educated to undergraduate level, indicating an inverse relationship between qualifications and satisfaction.

The next stage is to compare satisfaction with the system against the variable of whether participants manage the system at their current school. The results are located at the bottom of the table. Two results are statistically significant: one relates to the user-friendliness of reporting procedures ($t=-1.320$; $p<0.05$); the other to the system's function as a communication channel for managing risk events ($t=-1.393$; $p<0.05$). The results suggest that those currently using the system have more reservations about it than other staff, although the differences between some mean values are relatively small and, in the case of operating training, non-existent. Nevertheless, it seems that current system managers are more sensitive to certain issues, such as security and media calls for changes to the system, than non-system managers.

Table 5.4.1.1 Independent t-test within the comparison of personal opinions about operating the system measured against three variables

N=805

		Procedure are Simple	Effective for Manage risk	Communication Channel	Student Security	Operation Training	Clear Classification	Event change Regulation
Gender	Male	3.77	3.61	3.84	4.24	3.90	3.75	3.91
	Female	3.71	3.49	3.74	4.30	3.84	3.60	3.89
	t value	0.993	1.638	1.600	-1.066	1.172	2.371** P=0.029	0.284
Academic Qualification	University	3.78	3.61	3.86	4.26	3.90	3.72	3.89
	Master	3.69	3.48	3.67	4.24	3.84	3.69	3.95
	t value	1.374	1.668* P= 0.012	2,779*** P= 0.001	0.315	0.954* P=0.019	0.494	-0.999
Current Job	Yes	3.72	3.58	3.78	4.27	3.88	3.74	3.92
	No	3.79	3.57	3.86	4.24	3.88	3.67	3.88
	t value	-1.320* P= 0.013	0.106	-1.393* P=0.015	0.764	-0.015	1.273	0.696

*p<.05 **<.01 ***<.001

The analysis above compared participants' opinions about operating the system using a t-test with three main variables containing two sub-variables. In this section participants' opinions about their organizational management cultures will be measured against three variables (see Table 5.4.1.2). Organizational culture issues can also be categorized into two groups: participants' concepts of organizational obligations; and the influence of potential problems or side-effects on organizational dynamics when the system is used to manage risk at school. Just two of the results shown in Table 5.4.1.2 are statistically significant. There are gender differences between administrative managers over the question of whether to temporarily withhold an event in order to protect the school's reputation ($t=-1.466$; $p<0.01$); and in the question about whether one of the school's obligations is to anticipate and prevent accidents by analyzing the historical database, participants' academic qualifications are significant ($t=2.303$; $p<0.01$).

Broadly speaking though, there is no significant difference between the genders on organizational management culture issues. Likewise when gender is measured against the variables of academic qualification and whether participants are responsible for managing the system. However, there are some interesting patterns within the comparison results: male managers, for example, seem to feel more obliged to prevent events and share information across organizations than female managers; female managers meanwhile appear to be more worried that the system will be used for surveillance purposes by top-level management than their male counterparts. They are also more likely to believe that client privacy should be protected and that managers will be tempted to withhold details of events that might damage their schools' reputations (Male M=3.37; Female M=3.49).

Moreover, participants with a Master's degree are more likely than managers with a Bachelor's degree to be satisfied with most aspects of the system; however, it is interesting to see that participants with a higher education background seem less convinced that it is the school's obligation to deal with and prevent events, involving students or staff, than those with a high school or lower background. Participants responsible for managing the system seem to be the most positive about organizational obligation issues. However, they are more likely than the other staff to show negative attitudes towards issues such as invasion of clients' privacy, using the system to monitor schools, withholding events to protect a school's reputation and colleagues' hostility to managers responsible for operating the system.

Table 5.4.1.2 Independent t-test within the comparisons of personal opinions about the organisational management culture measured against three variables

N=805

		Obligation	Protect Privacy	Invaded Privacy	Surveillance	Prevent Accident	Data Analysis	Sharing Information	Protect Reputation	Colleagues Hostile
Gender	Male	4.26	4.43	3.55	3.25	4.01	3.86	4.04	3.37	2.94
	Female	4.20	4.45	3.50	3.30	3.96	3.80	4.01	3.49	2.76
	t value	1.279	-0.589	0.705	-0.607	1.025	0.932	0.499	-1.466** P=0.007	2.133
Academic Qualification	University	4.27	4.43	3.52	3.28	4.02	3.85	4.06	3.38	2.87
	Master	4.18	4.45	3.59	3.21	3.90	3.82	3.93	3.49	2.97
	t value	1.730	-0.434	-0.877	0.850	2.303** P=0.007	0.611	2.390	-1.370	-1.251
Current Job	Yes	4.29	4.44	3.52	3.22	4.00	3.86	4.06	3.39	2.87
	No	4.19	4.42	3.55	3.31	3.99	3.82	3.99	3.41	2.91
	t value	2.334	0.639	-0.442	-1.349	0.354	0.812	1.627	-0.269	-0.576

*p<.05 **<.01 ***<.001

The final task is to compare participants' opinions about dealing with events measured against three factors (See Table 5.4.1.3). Three topics are salient here: the rights and privacy of clients and their legal guidance; the characteristics of events described from participants' personal points of view; and the possible causes of events. As can be seen in the Table, three items are statistically significant. the first one discusses whether most sporadic events involve multiple-factors, which makes them hard to reduce, measured against the variable of gender ($t=1.823$; $p<0.01$), and the second one relates to the issue of whether the using of technology may help manage risk but may also cause new problems, measured against the gender variable as well ($t=-2.573$; $p<0.01$), and the third one returns to the issue about whether the sporadic events are hard to control, measured against the variable of whether the participants are responsible for managing the system($t=1.949$; $p<0.01$).

Generally speaking, when measured against the variable of gender the comparisons

show that male managers' responses to the questions raised are more likely to be positive than their female counterparts. For example, they are more likely to believe that campus events may happen to particular students, or to agree that both client and their legal guardians have a right to know about the reporting procedure. But the opposite is true about other issues to do with the rights of the client. For example, female managers are more likely to agree that schools should tell clients if an event is going to be sent to the CSRC, and that new events can be caused by new technology that is supposed to help prevent the happening of events.

When measured against the variable of academic qualification the comparisons also reveal some potential cleavages. For example, participants with Master's degrees seem more likely than those with Bachelor degrees to agree with most of the issues identified; however, they are less likely to be in favour of schools notifying clients and their legal guardians about the way the event will be dealt with, including the reporting procedure, than participants with Bachelor degrees.

Lastly, it can be seen that if a participant is responsible for managing the system, then they are more likely to believe that most events are caused by a particular group of students: that events with many unpredictable factors, including sporadic, frequency and latent events, are hard to prevent and reduce; and that new risks are created and accompanied by the of preventative technologies.

Table 5.4.1.3 Independent t-test within the comparison of personal experiences about the campus security events measured against three variables

N=805

		Particular Student	Event Sent out	Notify Legal Guidance	Right	Sporadic Event	Frequency Event	Latent Event	New Problem
Gender	Male	3.27	3.18	4.23	4.10	3.78	3.30	3.24	4.12
	Female	2.88	3.25	4.24	4.06	3.66	3.14	3.16	4.28
	T value	4.780	-0.868	-0.143	0.835	1.823** P=0.009	1.922	0.950	-2.573** P=0.008
Academic Qualification	University	3.16	3.19	4.24	4.10	3.75	3.23	3.20	4.14
	Master	3.19	3.23	4.22	4.05	3.75	3.33	3.30	4.24
	T value	-0.407	-0.402	0.241	0.962	0.099	-1.137	-1.167	-1.571
Current Job	Yes	3.21	3.16	4.20	4.08	3.81	3.26	3.25	4.20
	No	3.12	3.25	4.27	4.10	3.69	3.25	3.19	4.12
	T value	1.130	-1.204	-1.464	-0.284	1.949** P=0.007	0.156	0.763	1.410

*p<.05 **<.01 ***<.001

Comparing participants' opinions about the operation of the system, management culture and personal experience of dealing with events, using the statistical function of t-test against three independent variables (gender, academic qualification and systemic

responsibility) provides a more nuanced overview of their opinions and attitudes, and even show some potential patterns.

In general, with respect to gender, male managers' attitudes were more positive. This was the case with most issues, including system efficacy and utility function, organizational obligations, the potential problems or side-effects of using the system to manage risk and the characteristics of events. However, the analysis also reveals that female managers were more positive on issues relating to the rights and privacy of clients and their legal guardians, and the possible causes of events. Female managers were more likely to put student security before school study: that the system may be invasion of clients' privacy; and that school managers should notify legal guardians about the details of an event to protect their rights. Apart from this, it also seems that female managers are more sensitive about the monitoring function of the system, especially with respect to surveillance to school, and the possibility that colleagues may be harbouring resentments. Therefore, it could be argued that the female managers have extended their domestic role from the home to the workplace when it comes to risk management at school.

In terms of educational background, participants with lower educational qualifications seem to be more satisfied with most aspects of the system, including its efficacy and utility, concept of organizational culture and organizational obligation, and surveillance function. However, managers with higher academic qualifications expressed strong opinions on issues relating to the rights and privacy of clients and their legal guardians, potential problems or side-effects influencing the organizational dynamic, the characteristics of events, and the possible causes of events. For example, participants with a Master's background seemed to believe that the regulation of the system was susceptible to media concern; and were more likely to agree that using the system may infringe clients' rights to privacy. They were also more convinced that some managers withhold events to protect schools' reputations and that their role as operators of the system caused hostility amongst their colleagues.

As for the results relating to responsibility, participants charged with operating the system were more likely than other staff to agree that schools have an obligation to manage and deal with events, as well as the characteristics of events and the possible causes of events. On the other hand, participants not responsible for managing the

system were more likely to agree that schools have an obligation to protect the rights and privacy of clients and their legal guardians. They also believed that the system may have a negative effect on school dynamics. Predictably, participants responsible for operating the system were more concerned about how to handle or manage events than the rights of clients, and seemed ignorant of the possible/potential threats from notifying clients and their legal guardians about the details of how events are reported.

From the results presented, further significant patterns can be inferred to explore the participants' views on the efficacy and utility function of the system, and the potential problems that exist at the school and which may have already influenced the organizational dynamic. It could be surmised that participants' attitudes are likely to be influenced by characteristics such as gender, academic qualification and whether they are responsible for operating the system. However, the statistical function of the t-test simply examines the comparison with variables containing two sub-variables. Consequently, in the next section I will apply one-way analysis of variance (ANOVA) to the comparison measured against other independent variables with more sub-variables. The results should provide a more detailed picture of managers' opinions about the system efficacy or utility functions and their attitudes towards organizational obligations, the rights and privacy of clients, through the comparison measured against the multiple sub-variables.

5.4.2 Measurement of respondents' opinions about the operation of the CSRS measured with one-way analysis of variance (ANOVA)

In the previous section the results of the t-test compared against three independent variables containing two groups of individuals were considered. The comparisons reveal some significant patterns, which may be useful when it comes to understanding participants' concepts of and opinions about using the system, and might help highlight the interaction of organizational culture and organizational dynamics. However, although it is useful for understanding the differences and relationships between two sub-variables, only two sub-variables of each independent variable can be used in the statistical function of the t-test. Therefore, as Marsh and Elliott (2008: 183) point out, it may be necessary to use another appropriate statistical procedure for examining a continuous dependent variable and a categorical independent variable with more than two categories, in this case ANOVA.

In this section then, the measurement task will focus on the comparison of participants' opinions about three main groups of issues measured against more independent variables i.e. more than two groups of individuals. ANOVA will be used to compare the three main sets of questions measured against six independent variables, each of which has four sub-variables. The variables include participants' military rank, position in their department, the type of school they are working at, length of time they have been working in the military training office, length of time they have been working at their current schools, and their military training background.

To begin with, participants' opinions about operating the system are measured against the six independent variables (see Table 5.4.2.1). Five pairs of results are statistically significant. The first is related to the argument about the perceived clarity of the classification system and whether it includes every event, measured against the variable of rank ($F=2.835$; $p<0.05$). The next three pairs of significance are comparisons, measured against time spent working in the MTO, of opinions about the simplicity of the operating procedures of the system ($F=2.871$; $p<0.05$), whether the system is an effective form of risk management ($F=3.758$; $p<0.05$), and whether adequate training is provided for operators ($F=3.379$; $p<0.05$). The fifth significance shows on the issue of the effectiveness of the system for a school in managing risk measured against the variable of the length of time the participants have been serving at their current schools ($F=2.792$; $p<0.05$).

Here it is worth noting that some of the results show significant differences when the comparison of participants' opinions about operating the system are measured against the six independent variables. Firstly, the comparison result measured against the variable of rank, located in the first column of the Table, shows in relation to questions about whether security is more important than study at school. The lower ranking officers are more likely than the higher ranking ones to agree with this (Captain M=4.31; Major M= 4.27; Lieutenant Colonels M=4.23). Moreover, in contrast, the mean values of most of the issues by Captain are lower than that by Major. From this perspective, it seems that Majors are more likely than Captains to be satisfied with the operation of the system. However, the outcomes are reversed when the comparison is between Major and Lieutenant Colonel. Majors are less likely than Lieutenant Colonels to be satisfied with the operation of the system. Generally speaking, it can be concluded that participants who are Majors seem more satisfied with the operation of the system than

those who are Captains and Lieutenant Colonels.

Comparing opinions about operating the system measured against the variable of departmental position is reported in the second column of the Table. As can be seen, the discussion about the simplicity of operating the system measured against the participants' positions in the department shows that the general staff is likely more than the senior staff to be satisfied with the operation of the system, especially over whether the operating procedure of the system is simple (General staff working for less than two years M=3.80; General staff working for over two years M=3.75; Supervisor M=3.74; Head of Department M=3.74). The results also show that the senior staff may be a little less satisfied than junior staff regarding the risk management capabilities of the system and whether the system provides a communication channel between educational regimes; however, if the participant is also head of their department, their attitudes towards the operating procedures of the system become more positive. For example, the result with regard to the question about whether operators are given adequate training shows that junior staff and heads of departments are more likely than middle-level staff to agree that they are (General staff working for less than two years M=3.92; General staff working for over two years M=3.86; Supervisor M=3.88; Head of Department M=3.92). Finally, the examination result about the possibility of changing reporting regulations highlights that heads of department seems more than other staff to believe in this phenomenon (General staff working for less than two years M=3.86; General staff working for over two years M=3.91; Supervisor M=3.88; Head of Department M=3.98). In general, junior staff members are more likely than senior staff and heads of department to be satisfied with most of the operating procedures of the system. Conversely, senior staff are more likely than junior staff to place security before study and believe in the possibility of changing the reporting regulations of the system.

The third stage of the analysis involves comparing participants' opinions about operating the system measured against the variable of type of school worked at. The results are shown in the middle section of the Table and, generally speaking, there seems to be no significant differences in the opinions of managers working at the three different types of schools or by city/county; however, a common feature which can be found in most of the results is that city/county managers are more likely than participants working at other types of school to be satisfied with most of the efficacy and utility function aspects of the system.

The fourth stage is the examination of participants' attitudes towards operating the system measured against two independent variables used to determine whether participants' attitudes towards the functions of the system are dependent on length of service. The first variable relates to time spent in the Military Training Office (MTO) and is arranged in the fourth column of the Table. As can be seen, most of the results show that juniors are more likely than seniors to agree with the management function of the system, particularly regarding the effectiveness of the system for managing risk in schools (less than two years M=3.76; two to under five years M=3.63; five to under ten years M=3.50; over ten years M=3.47) and its capabilities as a communication channel across the educational institutions (less than two years M=3.90; two to under five years M= 3.86; five to under ten years M= 3.74; over ten years M=3.82).

The second variable relates to time served at current schools and is arranged in the fifth column of the Table. Here length of service seems to have had a slightly different effect on the participant' attitudes toward the operating functions of the system. Participants with longer tenures at their current schools are more likely to be positive about the simplicity of the operating procedure of the system (less than two years M=3.77; two to under five years M= 3.76; five to under ten years M= 3.64; over ten years M=3.93). By contrast, staff with shorter service times in the MTO are more likely to express positive attitudes about the system's ability to manage risk in schools (less than two years M=3.64; two to under five years M= 3.55; five to under ten years M= 3.40; over ten years M=3.71). Thus, according to the results of the comparison measured against these two variables, service time at MTO and at current school, participant's satisfaction with system efficacy and utility function would appear to gradually decrease with the increase of the participants' service time in the MTO; however, if they have been at the same organization for over ten years, participants tend to be satisfied with the efficacy and utility function of the system in line with the increase of their working time at the department.

The fifth and final stage of the analysis compares participants' opinions about operating the system against the variable of military training background.[1] The results of this stage suggest that, in general, participants with the higher levels of military training are more satisfied with the efficacy and utility function of the system – especially with respect to questions about the simplicity of the system operating procedures (Basic

[1] The opinions of the participant with summit training will be ignored as there is just one respondent.

Training M=3.70; Intermediate Training M=3.75; Advance Training M=3.78), the effectiveness of the system at managing risk in schools (Basic Training M=3.53; Intermediate Training M=3.56; Advance Training M=3.63), the perceived clarity of the classification system and whether it includes every event (Basic Training M=3.43; Intermediate Training M= 3.71; Advance Training M=3.77). However, participants with lower levels of military training were more likely to agree with statements to do with the basic functions of the system, such as its role as a communication channel for educational institutions. (Basic Training M=3.90; Intermediate Training M= 3.81; Advance Training M=3.81).

To sum up, ANOVA comparing attitudes towards the particular/utility function of the system measured against six independent variables produced five pairs of statistically significant results, which may in turn help to uncover some of the opinions toward the system held by managers from different backgrounds, as well as demonstrate the potential relationships and dynamic between school and city managers, or high and low ranking mangers.

In addition, the comparison of participants' personal experiences of operating the system measured against the variable of rank shows that Majors are more likely to express positive opinions towards the operating function of the system. It is noteworthy that participants' satisfaction with the utility function of the system may decrease with rank; however, the reverse can be seen in the more positive responses from heads of departments to the questions about the efficacy and utility function of the system. Not surprisingly, city/county managers are more positive than school managers about most aspects of the managing function of the system. Likewise, it is to be expected that participants who have been working for less than two years, either at the MTO or their current school, will be more satisfied with the operation of the system than other managers. Therefore, given the results of the comparisons, it seems reasonable to conclude that the longer participants work at an organization, the less satisfied with the efficacy and utility function of the system they become; however, this may change if they stay at the same organization for more than ten years; in this case they tend to be more satisfied with the system function than average. Finally, it can be seen that staff with higher levels of military training are more likely than other staff to be satisfied with the managing and operating functions of the system.

Table 5.4.2.1 One-way ANOVA within the comparison of personal opinions about operating the system measured against six variables

N=805

		Procedures are Simple	Effective for Manage Risk	Communication Channel	Student Security	Operation Training	Clear Classification	Change Regulation
Rank	Lieutenant	3.00	3.00	3.00	5.00	4.00	4.00	2.00
	Captain	3.75	3.45	3.78	4.31	3.88	3.47	3.86
	Major	3.80	3.61	3.85	4.27	3.89	3.77	3.91
	Lieutenant Colonel	3.69	3.56	3.77	4.23	3.87	3.67	3.90
	F value	1.616	0.658	0.899	0.857	0.091	2.835* P=0.037	2.243
Position in Department	General Staff(Le 2)	3.80	3.70	3.90	4.23	3.92	3.73	3.86
	General Staff(Ov 2)	3.75	3.55	3.81	4.24	3.86	3.67	3.91
	Supervisor	3.74	3.48	3.75	4.28	3.88	3.80	3.88
	Head	3.74	3.64	3.83	4.29	3.92	3.67	3.98
	F value	0.247	2.046	1.050	0.417	0.398	1.552	0.812
Work Place	High School	3.76	3.66	3.83	4.28	3.89	3.74	3.93
	Vocational	3.72	3.50	3.80	4.23	3.86	3.69	3.90
	Complete	3.85	3.49	3.74	4.23	3.91	3.67	3.80
	City/county	3.83	3.78	4.22	4.33	3.94	3.78	3.94
	F value	0.818	2.398	1.897	0.588	0.259	0.398	0.871
Years in MTO	less than 2Y	3.80	3.76	3.90	4.26	3.90	3.74	3.85
	2Y to 5Y	3.85	3.63	3.86	4.32	3.97	3.77	3.95
	over 5Y to 10Y	3.74	3.50	3.74	4.21	3.89	3.69	3.91
	over 10Y	3.62	3.47	3.82	4.25	3.75	3.64	3.89
	F value	2.871* P=0.036	3.758* P=0.011	1.641	1.171	3.379* P=0.018	0.987	0.512
Years in Current School	less than 2Y	3.77	3.64	3.86	4.28	3.90	3.71	3.88
	2Y to under 5Y	3.76	3.55	3.78	4.25	3.91	3.73	3.94
	5Y to 10Y	3.64	3.40	3.73	4.18	3,80	3.67	3.89
	over 10Y	3.93	3.71	3.91	4.29	3.84	3.76	3.91
	F value	1.864	2.792* P=0.040	1.321	0.981	1.084	0.310	0.335
Training Background	Basic Training	3.70	3.53	3.90	4.10	3.77	3.43	3.77
	Intermediate	3.75	3.56	3.81	4.25	3.88	3.71	3.92
	Advance	3.78	3.63	3.81	4.31	3.92	3.77	3.87
	Summit	4.00	4.00	4.00	4.00	4.00	4.00	4.00
	F value	0.124	0.361	0.132	1.096	0.559	1.749	0.539

*p<.05 **<.01 ***<.001

The previous section examined the participants' opinions about operating the system measured against six independent variables. In this section, their opinions about organizational management culture, including issues to do with privacy, the obligations of schools and educational institutions, and phenomena which may impact on organisations, will be considered. These will be measured against six independent variables, each containing four sub-variables, again using the statistical function of ANOVA (see Table 5.4.2.2).

Table 5.4.2.2 indicates that five comparison results reach statistical significance. The first two relate to the questions about whether the Ministry of Education is obliged to analyse the historical database, measured against the variable of participants' departmental positions ($F=2.818$; $p<0.05$) and whether reporting events amounts to surveillance in schools, measured against the variable of work place ($F=4.361$; $p<0.01$). The other three relate to the questions about whether schools have a duty to protect

students' privacy during school hours ($F=2.988$; $p<0.05$), whether they should attempt to anticipate and prevent student accidents with the help of historical database analysis ($F=4.653$; $p<0.01$), and whether the Ministry of Education is obliged to analyze the historical database" ($F=3.594$; $p<0.05$), all of which are measured against the variable of the length of service with the MTO.

Again, it is worth noting that the results reveal some marked patterns across the opinions of managers from different backgrounds and present multiple phenomena. The analysis begins with a comparison of attitudes to organizational culture measured against the variable of rank, shown at the top of the table. The results indicate that junior officers are more likely than senior officers to agree with some statements exploring the possible phenomena and obligations of organization, such as questions about whether the system is used to monitor schools (Captain M=3.41; Major M=4.32; Lieutenant Colonel M=3.16), or whether managers may withhold some events to protect schools' reputations (Captain M=3.45; Major M=43.41; Lieutenant Colonel M=3.39); conversely, juniors are less satisfied than seniors with their management culture in relation to organizational obligations and the interaction between managers/operators and administrative staff/teachers, over questions such as whether schools are obliged to prevent accidents happening to students (Captain M=4.10; Major M=4.26; Lieutenant Colonel M=4.24), or the possibility of colleagues becoming hostile due to the reporting of an event (Captain M=2.59; Major M=2.91; Lieutenant Colonel M=2.91). Junior staff are thus more likely to be concerned about the possibility that one of the system's functions is monitoring schools for the benefit of higher level managers, and may be more protective of the reputation of their organizations. Senior staff, on the other hand, are more likely to see risk management and prevention as an organizational obligation. They also seem to be more aware of the impact on organizational dynamics of reporting events through the system.

The results of comparing organisational management culture against the variable of participants' positions in the organizational hierarchy are presented in the second column of Table 5.4.2.2. Here the results show that junior staff is more likely to express positive attitudes towards issues related to client privacy and flag up the potential problems of using the system in schools, such as invasion of privacy (General staff working for less than two years M=3.62; General staff working for over two years M=3.54; Supervisor M=3.50; Head of department M=3.49) or the system as a form of

state surveillance and control (General staff working for less than two years M=3.31; General staff working for over two years M=3.28; Supervisor M=3.27;Head of Department M=3.14). Moreover, as staff in lower positions are more than likely to express concerns about student privacy and highlight the surveillance function of the system, it can therefore be concluded that status role is probably one of the factors influencing managers' attitudes and opinions on risk management.

The third stage of the comparison task involves exploring opinions about organisational culture measured against the variable of work place. Predictably, city/county managers are more likely than school staff to give positive answers to most of the questions about privacy and the prevention of events. There were some negative responses to questions about the potential problems caused by using the system to manage events, such as whether the reporting process is an invasion of client privacy (high school M=3.60; vocational school M=3.52; complete school M= 3.38; city/county M=3.39), and the possibility of hostility from colleagues for reporting of event (high, vocational and complete school M= 2.86, M=2.92 and 2.94 respectively; city/county M=2.67). Otherwise, city/county managers seemed to be more concerned about how to manage risk events than issues relating to client privacy and rights. Moreover, they were also more likely than most to believe that some managers withhold events to protect schools' reputations.

The comparison of organizational management culture measured against length of time in the MTO is shown in the fourth column of Table 5.4.2.2. According to the results, the participants' positive attitudes towards the possibility that managers may withhold some events are in direct proportion to their time in the MTO. For example, senior staff are more likely than junior staff to agree that some managers would withhold some events to protect their school's reputation (less than two years M=3.25; two to under five years M= 3.40; five to under ten years M= 2.89; over ten years M=3.55). The longer the participants had been working for the MTO, the more they seemed to believe that some managers are more concerned about their schools' reputations than dealing with or reporting events.

However, other results to do with organizational obligations in relation to preventing events suggest that participants' positive attitudes are directly proportional to the variable of their time in the MTO. These include the discussion about whether schools

have an obligation to deal with student accidents (less than two years M=4.30; two to under five years M= 4.29; five to under ten years M= 4.21; over ten years M=4.21), whether schools have to anticipate or prevent accidents happening to students (less than two years M=4.15; two to under five years M= 4.01; five to under ten years M= 3.94; over ten years M=3.93), whether educational regimes have to analyze the database (less than two years M=3.95; two to under five years M= 3.89; five to under ten years M= 3.83; over ten years M=3.70), and whether sharing information is an effective way to reduce the incidence of events (less than two years M=4.13; two to under five years M= 4.04; five to under ten years M= 3.99; over ten years M=3.98). Therefore, it seems that the longer managers serve at the MTO, the less satisfied they are on issues relating to organisational obligations; meanwhile, managers who spend less time at MTO are more concerned about client privacy and organizational dynamics/relationships.

As a consequence of this finding, it is necessary to compare organizational culture against the variable time spent at the current school. Two results show participants' positive attitudes decreasing with time spent at the current school: whether the Ministry of Education is obliged to analyze the database (less than two years M=3.88; two to under five years M= 3.82; five to under ten years M= 3.81; over ten years M=3.80) and hostility from colleagues towards those who report events (less than two years M=2.94; two to under five years M= 2.88; five to under ten years M= 2.83; over ten years M=2.76). Therefore, it may be closer to the truth to say that junior staff are more likely than senior staff to agree that organizations have a duty to analyze an event. Junior staff also appears to be more likely to encounter hostility from other colleagues as a result of reporting events.

In general, it is hard to find significant differences in participants' opinions about organizational management culture measured against the variables of time at MTO and time at current school. However, there do seem to be some inconsistencies in the impact of increase in time served. For example, juniors are less likely than seniors to be positive about the potential surveillance implications of the system; but when participants have served at the same school for over ten years, their attitudes may become towards the system's functions may become more positive (less than two years M=3.22; two to under five years M= 3.33; five to under ten years M= 3.31; over ten years M=3.07). Nevertheless, junior staff remain more convinced that managers may withhold some events to protect schools' reputations than senior staff.

To end this particular line of enquiry, participants' opinions about organizational culture are measured against their military training, the results of which can be seen at the bottom of Table 5.4.2.2. Broadly speaking, participants with higher military training are more likely than those with lower military training to have positive attitudes towards privacy issues and the obligations of organizations. However, when the argument focuses on whether one of the system's functions is surveillance of schools, the participants' positive attitudes decrease as their level of military training increases (Basic Training M=3.43; Intermediate Training M= 3.27; Advance Training M=3.17).

In summary, the following results from the comparison of attitudes towards the obligations of organizations and the potential problems of the system measured against six independent variables are worth noting. Firstly, participants with lower military rank and levels of training are more likely to be concerned about privacy issues. However, the reverse is true for the obligations of organizations. For example, the results show that higher-ranking managers are more likely than the lower-ranking ones to express positive attitudes towards the issue of whether organizations should analyse the database. Here it is interesting to note that participants with a lower military rank and level of training seem more likely to agree that the system has a surveillance function; whereas, managers with a higher military rank and level of training are more likely to be concerned about the possibility of colleagues resenting managers who are responsible for reporting events.

Secondly, it is important to point out that similar results occur in the comparison of opinions for both the heads of departments and the less general staff in relation to the discussion about organizations' obligation to analyze the database and the sharing of information for preventing events. Moreover, it is worth noting that as participants move up the ladder, from junior to senior, more positive attitudes are expressed about whether managers sometimes temporarily withhold events to maintain schools' reputations. It may be worth exploring the circumstances leading to events being withheld and there will be a further discussion in the next section.

Thirdly, the majority of city/county managers show a positive attitude toward issues relating to organizational sub-culture and dynamics. For example, city managers tend to dispute the phenomenon that reporting events may make other colleagues hostile toward the managers; however, school managers from three different types of schools present

similar positive attitudes toward such phenomenon. It seems that it is hard for managers working at higher levels of administrative units to comprehend that the reporting of an event may have an effect on interactional and organizational dynamics at the lower levels of a hierarchical organization. Fourthly, junior staff members who have served at an educational institution for less than two years appear to be more sensitive than seniors to issues related to client privacy and the possibility of resentment from colleagues due to the reporting of event, when measured against the variables of time spent in the MTO and time spent at current school. Also, junior staff are more likely to agree that the analysis of the events database is one of the obligations of educational regimes. However, the longer the time spent at the current school, the stronger the belief that some school managers withhold events that may harm their schools' reputations.

Finally, managers with higher levels of military training are more positive about client privacy and the organizational obligation to analyze the database than those with lower levels of military training. However, they are less convinced that one of the system's functions is to monitor schools. Meanwhile, managers with intermediate military training are more likely to believe that some managers may withhold information about certain events to protect their schools' reputations, and that some colleagues may resent event reporters.

Table 5.4.2.2 One-way ANOVA within the comparison of personal opinions about the organizational management culture measured against six variables

N=805

		Obligation	Protect Privacy	nvaded Privacy	Surveillance	Prevent Accident	Data Analysis	Sharing Information	Protect Reputation	Colleagues Hostile
Rank	Lieutenant	5.00	5.00	5.00	2.00	5.00	5.00	5.00	3.00	2.00
	Captain	4.10	4.45	3.49	3.41	3.86	3.82	4.04	3.45	2.59
	Major	4.26	4.45	3.56	3.32	3.99	3.82	4.03	3.41	2.91
	Lieutenant Colonel	4.24	4.40	3.52	3.16	4.02	3.88	4.02	3.39	2.91
	F value	1.670	0.844	1.034	2.527	1.856	1.202	0.775	0.129	1.869
Position in Department	General Staff(Le 2)	4.28	4.46	3.62	3.31	4.08	3.92	4.11	3.26	2.96
	General Staff(Ov 2)	4.19	4.43	3.54	3.28	3.95	3.78	3.98	3.52	2.94
	Supervisor	4.26	4.42	3.50	3.27	3.96	3.82	4.02	3.35	2.73
	Head	4.32	4.44	3.49	3.14	4.05	3.96	4.08	3.39	2.94
	F value	1.646	0.169	0.652	0.768	1.994	2.818* P=0.038	1.935	2.429	2.232
Work Place	High School	4.26	4.45	3.60	3.23	4.01	3.87	4.07	3.43	2.86
	Vocational	4.21	4.41	3.52	3.30	3.98	3.81	4.01	3.39	2.92
	Complete	4.28	4.40	3.38	3.38	3.96	3.83	3.92	3.31	2.94
	City/County	4.56	4.61	3.39	2.50	4.22	4.06	4.22	3.67	2.67
	F value	2.089	1.143	1.774	4.361** P=0.005	0.994	0.961	1.948	0.741	0.513
Years in MTO	less than 2Y	4.30	4.48	3.57	3.28	4.15	3.95	4.13	3.25	2.85
	2Y to under 5Y	4.29	4.51	3.51	3.28	4.01	3.89	4.04	3.40	3.02
	5Y to under10Y	4.21	4.37	3.53	3.30	3.94	3.83	3.99	3.41	2.89
	over 10Y	4.21	4.42	3.55	3.12	3.92	3.70	3.98	3.55	2.77
	F value	1.375	2.988* P=0.030	0.189	1.172	4.653** P=0.003	3.594* P=0.013	1.878	2.273	1.778
Years in Current School	less than 2Y	4.25	4.44	3.57	3.22	4.03	3.88	4.06	3.36	2.94
	2Y to under 5Y	4.26	4.44	3.49	3.33	3.99	3.82	4.01	3.45	2.88
	5Y to under 10Y	4.24	4.41	3.58	3.31	3.91	3.81	3.96	3.40	2.83
	over 10Y	4.18	4.44	3.45	3.07	3.96	3.80	4.07	3.47	2.76
	F value	0.232	0.065	0.568	1.372	1.309	0.467	0.913	0.528	0.690
Training Background	Basic Training	4.13	4.43	3.47	3.43	3.97	3.77	4.00	3.23	2.83
	Intermediate	4.23	4.42	3.56	3.27	3.97	3.82	4.01	3.44	2.90
	Advance	4.33	4.49	3.49	3.17	4.09	3.94	4.10	3.29	2.88
	Summit	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.00	4.00
	F value	1.698	0.863	0.413	0.989	1.619	1.339	0.897	1.353	0.442

*p<.05 **<.01 ***<.001

The analyses above revealed more about the participants' different attitudes towards the issues of organizational obligations and the potential problems for organizational dynamics, when measured against the participants' multiple backgrounds. In this section I will focus on the comparison of the participants' personal experiences of dealing with the events in relation to the issues of the rights and privacy of the client, the particular characteristics of events, and the possible causes of events, measured against six independent variables (see Table 5.4.2.3). Five results are statistically significant: the comparison in relation to questions about whether sporadic events are hard to control, measured against the variable of rank ($F=3.290$; $p<0.020$); whether events may happen to particular groups of students, measured against the variable of work place ($F=4.379$; $p<0.01$); whether events may happen to particular groups of students, measured against the variable of time spent in the MTO ($F=4.080$; $p<0.01$); whether frequently occurring events such as car accidents are difficult to prevent, measured against the variable of

time in the MTO ($F=2.963$; $p<0.05$); and whether latent events are hard to anticipate, measured against time in the MTO ($F=4.330$; $p<0.01$).

The results relating to participants' personal characteristics present their major attitudes towards each issue. Firstly, the comparisons of participants' opinions about dealing with events measured against the variable of rank are shown at the top of Table 5.4.2.3. It can be seen that the junior officers express less satisfaction than seniors about whether events may happen to particular groups of students (Captain M=2.90; Major M=3.20; Lieutenant Colonel M=3.16) and whether schools should notify clients about how events will be reported (Captain M=3.18; Major M=3.24; Lieutenant Colonel M=3.15). Also, the majority of participants show the strangest attitudes on some issues, with mean values over 4, in relation to questions about whether schools should notify the client's legal guardian of the event (Captain M=4.14; Major M=4.26; Lieutenant Colonel M=4.20), whether client and their legal guardian have the right to know the reporting procedure (Captain M=4.08; Major M=4.09; Lieutenant Colonel M=4.10), and whether new problems may arise from the use of technology (Captain M=4.14; Major M=4.17; Lieutenant Colonel M=4.15). The results show most of the managers agree with these issues and their attitudes are probably unrelated to their military rank.

Secondly, comparing managers' personal experiences of dealing with events measured against the variable of current departmental position (see second column of Table 5.4.2.3) it is interesting that junior staff present more positive attitudes than seniors, in particular about whether events happen to certain types of students (General staff less than two years M=3.24; General staff over two years M= 3.14; Supervisor M=3.16; Head of Department M=3.14), and whether a school should notify the client's legal guardian of the event (General staff less than two years M=4.25; General staff over two years M= 4.24; Supervisor M=4.20; Head of Department M=4.24). However, regarding the characteristics of particular events, the results would appear to reverse, with junior staff less likely than senior staff to present positive attitudes on the issues high-frequency and latency events may be hard to prevent and reduce (General staff less than two years M=3.08; General staff over two years M= 3.24; Supervisor M=3.28 Head of Department M=3.23), and new problems may arise from the use of technology (General staff less than two years M=4.10; General staff over two years M= 4.13; Supervisor M=4.23; Head of Department M=4.20). In addition, it is worth noting that managers' positive attitudes appear to gradually decline with seniority in relation to

whether events happen to particular groups of students but increase with regard to whether new problems are caused by the use of the system's technology. Given such trends it may be conjectured that managers' confidence in their ability to control or prevent events may decrease as their experience accumulates and/or they rise through the hierarchy, as their awareness that the uncertainty of an event is not only influenced by the event itself but also by random causes. Alternatively, they develop a form of inertia to reporting through repeated exposure to a problem.

Moving on to the comparisons of personal experiences of dealing with events measured against the variable of type of school worked at, presented in the third column of Table 5.4.2.3, it can be seen that the majority of managers express the highest positive attitudes about issues whose mean values are over 4 in total – including whether schools should notify clients' legal guardians, whether clients and their legal guardians have the right to know about the reporting procedure, and whether new events may accompany the use of the system. In general, the comparisons reveal no significant differences over client privacy/rights and events with particular characteristics measured against the variable of types of school worked at. However, it is interesting to note that city/county managers are more likely than school managers to be negative about whether schools should notify clients that an event will be sent to the CSRC (High school M=3.18; Vocational school M=3.22; Complete school M=3.26; City manager M=2.89). Such results suggest that city/county managers are more likely to be concerned about the procedure for managing events than the protection of clients' rights and privacy.

Fourthly, in the comparison of participants' personal experiences of dealing with events measured against the variables of time served in the MTO and current school, some results show that the participants support some of the claims, where mean values are over 4 in total. This suggests that participants' attitudes toward these issues are unrelated to the time they have served in the MTO or at their current school – they include the issue of whether schools should notify the clients' legal guardian, whether clients and their legal guardian a have right to know about the reporting procedure, and whether new events may accompany the use of the system. Broadly speaking, there is no noteworthy difference within the comparison measured against the variable of time spent in either the MTO or at the current school. However, managers relatively new to their current organizations are more likely to agree that events may happen to particular students than managers that have been in their departments for over five and less than

ten years, who are most likely to believe that the majority of events are hard to prevent or reduce, sporadic, frequent or latent.

To finish, there is an exploration of managers' personal experiences of dealing with events measured against their military training background, shown at the bottom of Table 5.4.2.3. As can be seen, three results indicate stronger positive attitudes towards certain issues, with mean values over 4 across four sub-variables. These are to do with whether schools should notify the client's legal guardian, whether clients' and their legal guardian have a right to know about the reporting procedure, and whether new events may accompany the use of the system. Other results worth noting are, for example, participants with lower levels of military training are more likely to present positive attitudes on issues to do with clients' rights such as the question about whether schools should notify the client that the event will be sent to the CSRC (Basic training M=3.30; Intermediate training M=3.22; Advance training M=3.12; Summit training M=2.00). However, this result is reversed when the discussions relate to the rights of client's legal guardians. That is to say, managers with higher levels of military training are more likely to agree that clients and their legal guardians have a right to know about how events are reported (Basic training M=4.07; Intermediate training M=4.08; Advance training M=4.12).

To sum up, the results obtained by comparing managers' personal experience of dealing with events measured against six independent variables would appear to reveal some basic differences in attitude towards issues such as client privacy and the rights of the client, as well as the interpretation of particular types of events and their causes. Broadly speaking, the higher ranking managers seem to be more positive on issues relating to the right of clients and their legal guardians, and events with particular characteristics such as sporadic, frequent and latent events. However, this positivity does not extend to schools notifying clients that an event will be sent to the CSRC. One explanation for this may be that the higher-level managers tend to avoid any potential side-effects or uncontrollable factors when dealing with events. City/county managers seem to have stronger opinions on issues relating to the rights of clients and their legal guardians, the characteristics of particular events, and whether events are caused by the system itself but the majority of managers appear to change their attitudes toward dealing with and facing the events the longer they spend at the MTO or at their current schools. Senior staff are less likely than the junior staff to believe that events normally

happen to particular groups of students, when their opinions are compared measured against both time served in the MTO and current schools. Seniors are also less likely than juniors to agree that schools should give the client legal guidance about the details of events. Lastly, participants' attitudes towards events are clearly influenced by the amount of professional military training they have had, especially when it comes to the rights of clients and their legal guardians. Participants with substantial military training are more likely to express positive attitudes towards client rights and the characteristics of particular events.

Table 5.4.2.3 One-way ANOVA within the comparison of personal experiences of campus security event measured against six variables

N=805

		Particular Student	Event Sent out	Notify Legal Guardians	Right	Sporadic Event	Frequency Event	Latent Event	New Problem
Rank	Lieutenant	5.00	1.00	5.00	5.00	2.00	2.00	2.00	4.00
	Captain	2.90	3.18	4.14	4.08	3.47	3.14	2.96	4.14
	Major	3.20	3.24	4.26	4.09	3.78	3.24	3.23	4.17
	Lieutenant Colonel	3.16	3.15	4.20	4.10	3.76	3.30	3.25	4.15
	F value	2.378	2.173	1.288	0.617	3.290* P=0.020	0.957	1.667	0.069
Position in Department	General Staff(Le 2)	3.24	3.18	4.25	4.05	3.74	3.18	3.08	4.10
	General Staff(Ov 2)	3.14	3.19	4.24	4.10	3.70	3.26	3.24	4.13
	Supervisor	3.16	3.31	4.20	4.12	3.87	3.32	3.28	4.23
	Head	3.14	3.09	4.24	4.09	3.73	3.22	3.23	4.20
	F value	0.347	1.348	0.203	0.338	1.544	0.569	1.275	1.238
Work Place	High School	3.02	3.18	4.28	4.11	3.77	3.15	3.16	4.14
	Vocational	3.26	3.22	4.22	4.08	3.75	3.32	3.24	4.17
	Complete	3.34	3.26	4.10	4.03	3.61	3.34	3.32	4.17
	City/County	3.28	2.89	4.28	4.22	4.17	3.44	3.33	4.44
	F value	4.379** P=0.005	0.764	1.817	0.519	2.196	2.130	0.775	0.959
Working in MTO	less than 2Y	3.24	3.12	4.34	4.06	3.65	3.06	2.96	4.12
	2Y to under 5Y	3.32	3.25	4.22	4.11	3.67	3.25	3.25	4.11
	5Y to under 10Y	3.13	3.19	4.22	4.11	3.81	3.36	3.32	4.18
	over 10Y	2.95	3.24	4.16	4.04	3.84	3.23	3.25	4.23
	F value	4.080** P=0.007	0.546	1.792	0.523	2.226	2.963* P=0.031	4.330** P=0.005	0.872
Worked in Current School	less than 2Y	3.27	3.15	4.30	4.09	3.76	3.21	3.18	4.17
	2Y to under 5Y	3.11	3.21	4.20	4.13	3.72	3.26	3.29	4.14
	5Y to under 10Y	3.06	3.29	4.15	4.05	3.77	3.36	3.26	4.18
	over 10Y	3.04	3.33	4.13	4.05	3.78	3.24	3.07	4.15
	F value	2.224	1.012	2.545	0.452	0.136	0.641	1.044	0.154
Training Background	Basic Training	3.27	3.30	4.23	4.07	3.53	3.03	2.83	4.13
	Intermediate	3.13	3.22	4.22	4.08	3.80	3.27	3.26	4.16
	Advance	3.27	3.12	4.27	4.12	3.63	3.24	3.14	4.16
	Summit	3.00	2.00	4.00	4.00	3.00	3.00	3.00	4.00
	F value	0.907	1.063	0.279	0.130	2.603	0.556	2.163	0.031

*p<.05 **<.01 ***<.001

In this section, the main focus has been on participants' responses to three groups of questions measured against six independent variables, each of which contains four sub-variables, using the statistical function of one-way ANOVA. Their satisfaction levels, conceptions of and opinions about each issue can be distinguished and classified by contrasting the sub-variables in each independent variable. Some of the results may

be simply general conceptions of the function of the system for most of the participants; the others show the participants' perspectives and value-judgements about the reporting of events and the system more generally.

According to the results relating to military rank, it seems that middle-ranking managers are the most satisfied with the efficacy/utility function of the system and most likely to believe that organisations have an obligation to deal with and prevent events. They are also are more concerned with the rights and privacy of clients, as well as the potential problems or side-effects of using the system. The majority of participants, regardless of military rank, present the highest positive attitudes on issues relating to the priority of student security at schools, the privacy and right of client and their legal guidance, and the possibility of cause of new event.

The results relating to departmental role suggest that junior staff are more likely than senior staff to be satisfied with the efficacy and utility of the system, support the rights and privacy of clients, but are concerned about the potential problems of the system such as its surveillance function, and believe that the causes of events can be predicted, for example, by distinguishing particular groups of students. Seniors, on the other hand, are more attuned than juniors to organizational cultural issues such as whether the regulation of the system may be changed because of media concerns, or whether educational regimes have an obligation to conduct historical data analysis.

The results relating to the types of school participants are working at reveal that city/county managers are more satisfied with most of the issues in regard to the efficacy and utility function of the system, and the obligation and culture of event management of organizations. It is also worth noting that the city/county managers see student security as more important than study at school, and generally believe some potential problems exist at school such as the temporary concealment of events to protect schools' reputations. However, it can also be seen that the city/county managers are more likely than the school managers to express negative attitudes on the following issues: the system surveillance function, which is one of the possible side-effects on schools, the possibility of hostility towards the event operators, which is one of the potential problems, and whether schools should notify clients that events will be sent out, which is one of the rights of clients.

Comparing length service times in the MTO and current schools shows that junior staff

are more likely than senior staff to express positive attitudes on most issues, including the efficacy and utility function of the system, organizational culture, schools' obligations, the rights and privacy of clients and their legal guardians, regardless of their length of service. However, the reverse is true when the argument moves on to the potential problems or side-effects of using of the system, the characteristics and possible causes of events, juniors are less positive than seniors. Given this tendency, it seems reasonable to suppose that a manager's attitude towards the system is influenced by his or her personal experiences of dealing with events. The relative emphasis they place on client privacy/rights as opposed to the management of events will also change, depending on their departmental responsibilities. The interaction or relationships between managers and their colleagues are likely to be related to length of service, in other words, the longer the managers spend at a department, the more the things they do will be accepted by their colleagues.

The results relating to level of military training suggest that participants with higher level military training are more likely to be satisfied with the efficacy and utility of the system, the organizational obligation and the right and privacy of clients and their legal guidance. It is interesting to note that participants with an intermediate training background are the most likely to believe that school managers may be tempted to withhold the details of events in order to protect their schools' reputations and that some colleagues can be hostile towards managers. Participants with a higher level training qualification are also less likely to believe that the system is used for surveillance purposes, or to agree with schools notifying clients that an event will be sent to the CSRC.

Overall, to conclude this section, some statistically significant results have been obtained by comparing participants' responses to three main groups of questions, measured against each independent variable containing two or four groups of sub-variables using the statistical measurement tasks of t-test and one-way ANOVA. Some of the results suggest significant patterns or trends in managers' opinions about the operation of the system. Some highlight the role of organizational dynamics in risk management and the interaction between managers and other colleagues at schools. Others reflect participants' experiences of dealing with events and their respective self-awareness. Obviously, managers approach risks with different viewpoints or attitudes depending on their position or status, which may require them to consider the

impact or side-effects of their actions on the organization as a whole. Therefore, it is worth delving deeper here into the links between dealing with an event and protecting organizational reputation by looking at two particular groups of managers, the most junior and most senior staff of a department. By doing so, it may be possible to distinguish differences in opinions between managers with multiple backgrounds. In the next section, I will therefore attempt to explore such phenomena and the results will hopefully provide more information to help understand and explain the dynamics of risk management in hierarchical regimes.

5.5 Overview: managers' attitudes towards the implications of risk assessment and management

The previous section compared the participants' opinions about using the system to manage events: while the t-test enabled us to determine some initial and important differences between male and female managers, the subsequent use of ANOVA identified further differences with respect to military rank and position in regard to managing the system. Such findings are likely not only to provide evidence about differing opinions of the operation of the system from participants with different backgrounds, but also to demonstrate some possible or potential phenomena that may be evidence of some other interactions/different perspectives between general staff and head of the department or the manager and colleagues at school, which could reflect wider aspects of the organisational culture and dynamics.

However, the comparison undertaken above just shows general statistical results for participants' opinions on three groups of questions, measured against a single variable. In order to gain a clearer sketch of the participants' opinions and define the possible boundary between the organizational discipline and the participants' attitudes when managing events, I will reintegrate all the questions with similar attribution and classifications into four new groups of issues. These new issues will be used to examine the participants' perspectives through particular groups of samples, which may provide more trends and patterns to help understand the managers' opinions of dealing with the events.

In order to define a possible boundary between the discipline of the organisation and the values of managers with different backgrounds, the samples will be limited according to some particular characteristics such as rank and seniority. More mature school staff will

be compared with the inexperienced, which may help us to distinguish different concepts of risk management. The problem is that only three variables are allowed in the SPSS statistical software at the same time. Therefore, both the statistical tools of SPSS and Excel will be applied to the comparisons in this section.

In this section, consequently, the first major task is the measurement of four new groups of issues compared against the two contrasting samples (the more senior and less junior staff) and the total population. The results may reveal some ambivalence or divergence across the different backgrounds of the participants. Secondly, if the comparison of results presents some significant or particular patterns, those issues and outcomes will be discussed further. Such comparison tasks will probably not only show more multiple trends, which present the diversity of attitudes among the participants with different experience or seniority, but also may throw light on some potential phenomena at local school level and which influence most of the managers there.

5.5.1 Comparison of senior and junior staff attitudes

As discussed above, the focus here is on particular groups of samples, classified into two groups (the more senior and junior staff). With respect to the first of these, some characteristics are key to defining the group, such as having the highest military rank – 'Lieutenant Colonel' and the longest service time at MTO and current school – over ten years. Using this basis, twenty-one participants were found to match the limitation. The second group, the more junior staff, was defined according to their status as 'Major', the most common of the ranks. The common characteristic of the more junior managers is that their length of service at the MTO and their current school is less than two years, the shortest of any of the managers in my sample. In total, ninety-nine participants fell into this category. In the following discussion I will explore the results by comparing four particular groups of issues measured against these two groups.

Here I am mainly interested in respondents' views on using the system, the simplicity of its operating procedures, whether adequate training is provided for operators and the perceived clarity of the classification system and whether it includes every event they confront. With respect to the senior group (See Table 5.5.1.1) unsurprisingly, perhaps, no participant shows an opinion at the highest positive scale over the three questions. The data indicate that most of the more senior staff are satisfied with the system's operational functionality, and believe that the system's procedures and the training

programme help them to manage risk-related events at school.

Table 5.5.1.1 Results showing the evaluation of using the system (Senior Staff) N=21

Evaluation of Using System (Senior Staff)						
Status Question / Opinion		Strong Disagree	Disagree	Neither	Agree	Strong Agree
Rank Lieutenant Colonel	Q15 Procedure	0	0	3(14.3)	16(76.2)	2(9.5)
Working Time at MTO Over 10 years	Q19 Knowledge	0	0	5(23.8)	15(71.4)	1(4.8)
Working Time at School Over 10 years	Q20 Classification	0	1(4.8)	6(28.6)	14(66.7)	0

With the junior group, attitudes (See Table 5.5.1.2) are more positive than negative over the three questions, a similar result to the senior staff. However, compared with senior staff, there are minor reservations about the use of the system and its classification of events.

Table 5.5.1.2 Results showing the evaluation of using the system (Junior Staff) N=99

Evaluation of Using System (Junior Staff)						
Status Question / Opinion		Strong Disagree	Disagree	Neither	Agree	Strong Agree
Rank Major	Q15 Procedure	0	6(6.1)	14(14.1)	71(71.7)	8(8.1)
Time at MTO Under 2 years	Q19 Knowledge	0	4(4)	11(11.1)	74(74.7)	10(10.1)
Time at School Under 2 years	Q20 Classification	1(1)	5(5.1)	13(13.1)	70(70.7)	10(10.1)

Both results above suggest that there are no major differences in the participants' attitudes towards the operation of the system based on seniority. Likewise, the opinions of the total population (see Figure 5.5.1.1) on this set of issues are similar to those of more senior (see Figure 5.5.1.2) and more junior staff (see Figure 5.5.1.3) with similar distributions and trends, most participants expressing more positive attitudes than negative ones across the three groups of samples. Therefore, it seems reasonable to conclude that managers' satisfaction with using/operating the system is neither related to their military rank and time at the MTO/current schools, nor whether they are the more senior staff or more junior ones.

Figure 5.5.1.1 Likert Scale distribution relating to the evaluation of use of the system (Total Population: N=805)

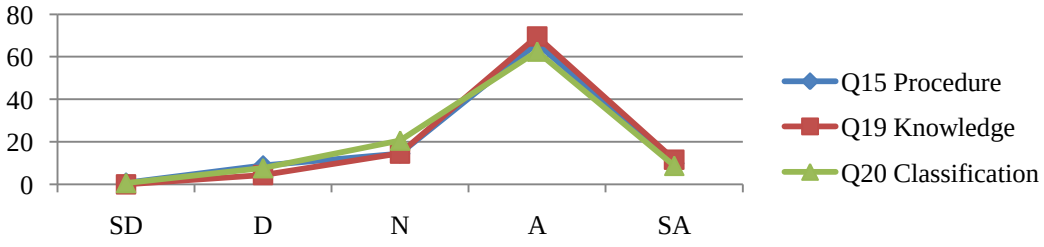


Figure 5.5.1.2 Likert Scale distribution relating to the evaluation of use of the system (Senior Staff: N=21)

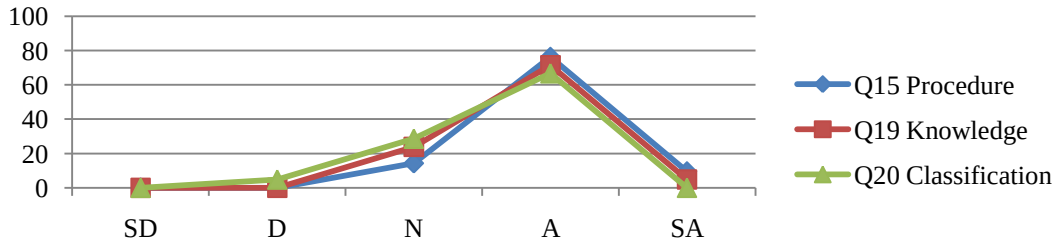
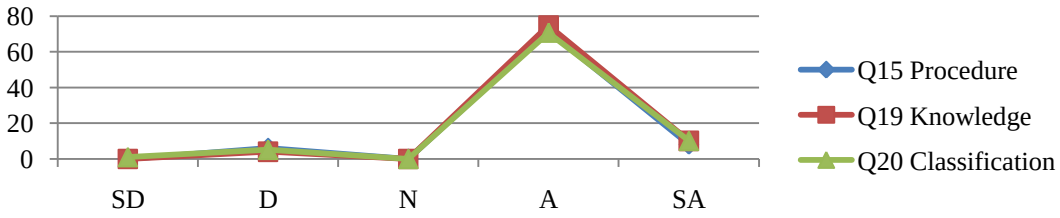


Figure 5.5.1.3 Likert Scale distribution relating to the evaluation of use of the system (Junior Staff: N=99)



The second group of issues examines the participants' viewpoint in managing risk through their personal attitudes towards organizational obligations and expectations including whether student security itself is more important than studying at school, whether schools are under obligation to deal with events that happen to students, the perceived effectiveness of the analysis of the historical record for a school in managing risk, and whether the analysis of the historical database is one of the responsibilities of the Ministry of Education. The initial comparison with respect to organizational responsibilities show that most senior staff, whatever their location, agree that the government is under an obligation/expectation to prevent events and protect students at school (see Table 5.5.1.3). They also tend to agree with the assertion that security takes precedent over the pursuit of knowledge at school.

Table 5.5.1.3 Attitudes of Senior Staff opinion relating to the responsibilities, obligations and expectations of the organisation

N=21

Obligations/ Expectations of Using System (Senior Staff)						
Status Question	Opinion	Strong Disagree	Disagree	Neither	Agree	Strong Agree
Rank Lieutenant Colonel Time at MTO Over 10 years Time at School Over 10 years	Q18 Security	0	0	0	14(66.7)	7(33.3)
	Q22 Obligation	0	0	2(9.5)	15(71.4)	4(19.0)
	Q26 Anticipation	0	0	3(14.3)	16(76.2)	2(9.5)
	Q27 Analysis	0	1(4.8)	6(28.6)	13(61.9)	1(4.8)

With regard to the same issues, the attitudes of the more junior staff (see Table 5.5.1.4) are slightly less positive when it comes to the obligations and expectations of schools, especially whether student security at school is more important than studying, and whether schools are under an obligation to deal with and prevent events. In general, it can be seen that most of the junior staff show more positive attitudes than negative ones toward the organizational obligations and expectations about the use of the system for managing events and in regard to the latter do so more strongly than their senior counterparts.

Table 5.5.1.4 Attitudes of Junior Staff relating to the responsibilities, obligations and expectations of the organisation

N=99

Obligations/ Expectations of Using System (Junior Staff)						
Status Question	Opinion	Strong Disagree	Disagree	Neither	Agree	Strong Agree
Rank Major Time at MTO Under 2 years Time at School Under 2 years	Q18 Security	0	1(1)	4(4)	58(58.6)	36(36.4)
	Q22 Obligation	0	1(1)	3(3)	61(61.6)	34(34.4)
	Q26 Anticipation	0	1(1)	9(9.1)	63(63.6)	26(26.3)
	Q27 Analysis	0	4(4)	17(17.2)	61(61.6)	17(17.2)

Comparing these results with the wider population (see Figure 5.5.1.4, 5.5.1.5 and 5.5.1.6) similar trends can be seen across the three Figures. Despite a few negative opinions, most of the participants seem to agree with the statements relating to personal judgment or awareness. For example, they tended to support the view that student security is more important than study at school, that schools are under an obligation to deal with and anticipate/prevent risk events happening to students, and that educational management regimes should undertake analyses of the historical database.

Figure 5.5.1.4 Attitudes across the Total Population relating to security, risk management, analysis and organizational obligations (N=805)

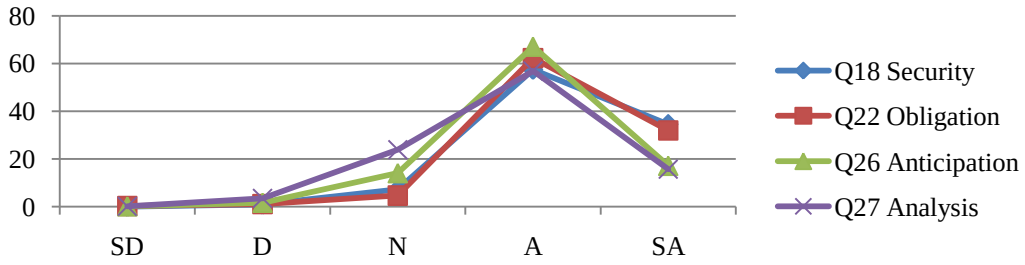


Figure 5.5.1.5 Attitudes of Senior Staff relating to security, risk management, analysis and organizational obligations (N=21)

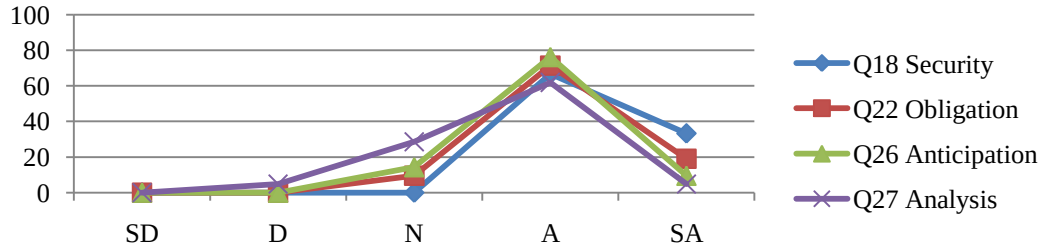
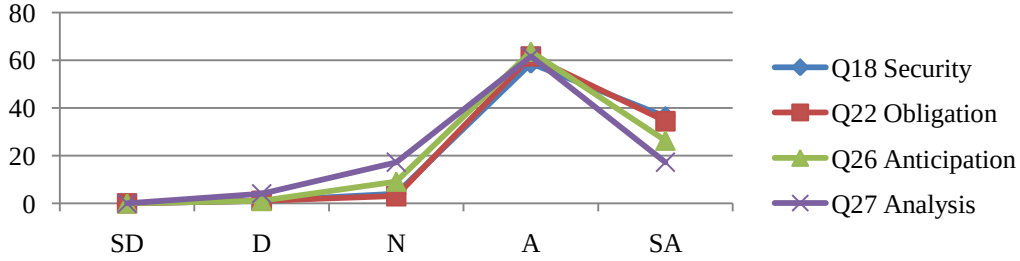


Figure 5.5.1.6 Attitudes of Junior Staff relating to security, risk management, analysis and organizational obligations (N=99)



Moving on to participants' attitudes towards the system's management functions and the invisible/potential problems of using the system to manage events, the seven questions classified into this group include: Question 16 (the usefulness of the system managing risk); Question 17 (whether the system provides an effective communication channel between the educational regimes and schools); Question 25 (the controversial issue of whether schools are monitored by the Ministry of Education through the system); Question 28 (which relates to the discussion about whether event prevention can be

improved by sharing information about events); and three other questions 35, 36 and 37 (which ask whether sporadic, frequent and latent events are hard to prevent and reduce in that they are caused by many unpredictable and unavoidable factors).

Seniors' opinions (see Table 5.5.1.5) about using the system for risk management contrast with their attitudes towards the other reclassified issues above. They seem reluctant to disclose their opinions on some system management function issues, to do with the effectiveness of the system for managing risk, whether the system has established a communication channel across educational institutions, and the effect of sharing information on reducing the incidence of similar events. When the discussion issues move on to particular events caused by uncertain or unpredictable factors, their opinions are more diverse. For example, some seem to believe that sporadic, frequent and latent events are influenced by multiple-factors, which makes them unpredictable and difficult to prevent, while strong negative attitudes are shown on these issues in the Table. This trend is pronounced in the discussion of latent events; over fifty percent of the more senior staff disagreed that latent events are uncontrollable, which may because senior staff shoulder more responsibility for managing and preventing risks at school; therefore, they may try to anticipate possible events potentially under their control.

Similar patterns can also be seen in the discussion about the system's surveillance function, which reveal a degree of ambivalence and doubt amongst senior staff. Such results suggest that the definition of risk boundaries or limitations may differ between individual senior staff. They probably highlight some underlying phenomena but, taken by themselves, these results are not enough to explain the causal links and interactions in the organisations in question. Therefore, it will be necessary to explore such phenomena and causes in more detail later on.

Table 5.5.1.5 Attitudes of Senior Staff relating to using the system to manage risks

M=21

Using System to Manage Risk (Senior Staff)						
Status Question / Opinion		Strong Disagree	Disagree	Neither	Agree	Strong Agree
Rank Lieutenant Colonel Time at MTO Over 10 years Time at School Over 10 years	Q16 Effective	0	1(4.8)	5(23.8)	12(57.1)	3(14.3)
	Q17 Communication	0	0	4(19.0)	12(57.1)	5(23.8)
	Q25 Surveillance	1(4.8)	9(42.9)	7(33.3)	4(19.0)	0
	Q28 Sharing	0	1(4.8)	2(9.5)	14(66.7)	4(19.0)
	Q35 Sporadic	0	4(19)	4(19)	11(52.4)	2(9.5)
	Q36 Frequent	1(4.8)	8(38.1)	5(23.8)	7(33.3)	0
	Q37 Latent	0	11(52.4)	5(23.8)	5(23.8)	0

The exploration above revealed some divergence in seniors' viewpoints on the system's risk management functions managing and the opinions of juniors (see Table 5.5.1.6) also appear to diverge. Their attitudes towards the system's risk management function were mostly negative but, in general, they were even more ambivalent than their more senior counterparts. On one hand, junior staff are much more positive than seniors about the usefulness of the system for managing events and establishing a communication channel across educational regimes, as well as the possibility that sharing information amongst schools helps reduce the incidence of similar events. On the other hand, they are much more negative on issues related to the question of whether it is difficult hard to manage or deal with particular events because of uncertain and unpredictable factors. The junior staff seems to believe events could be prevented and reduced by system management functions such as the sharing or collecting of information about and experiences of similar events; however, they are likely to extend their stronger attitudes to both sides, especially on the surveillance issue.

Table 5.5.1.6 Attitudes of Junior Staff relating to using the system to manage risks

M=99

Using System to Manage Risk (Junior Staff)						
Status Question		Strong Disagree	Disagree	Neither	Agree	Strong Agree
Rank Major Time at MTO Under 2 years Time at School Under 2 years	Q16 Effectiveness	3(3)	4(4)	18(18.2)	57(57.6)	17(17.2)
	Q17 Communication	2(2)	3(3)	9(9.1)	68(68.7)	17(17.2)
	Q25 Surveillance	3(3)	22(22.2)	26(26.3)	36(36.4)	12(12.1)
	Q28 Sharing	1(1)	3(3)	7(7.1)	66(66.7)	22(22.2)
	Q35 Sporadic	0	18(18.2)	10(10.1)	57(57.6)	14(14.1)
	Q36 Frequency	2(2)	38(38.4)	19(19.2)	33(33.3)	7(7.1)
	Q37 Latent	4(4)	39(39.4)	17(17.2)	31(31.3)	8(8.1)

The following Figures compare attitudes on the seven issues across the three population groups (see Figure 5.5.1.7, 5.5.1.8 and 5.5.1.9). According to the results shown in the Figures, the participants present both positive and negative attitudes on these issues across the three population groups. Seniors are more likely to disagree than the other two population groups, especially on the issue of whether the system is used for surveillance of schools or whether latent events are hard to anticipate because of some uncontrollable factors. This trend is contrary to the Figures relating to the total population and the more junior staff; they show more positive attitudes overall.

The distribution results above demonstrate the considerable diversity of opinion that seems to exist amongst the sample. The results not only indicate participants' attitudes towards the use of the system for risk management, but also appear to suggest an underlying ambivalence towards the system's functions and purpose. More

multidimensional attitudes were revealed than in the discussion of the other two sets of issues and the comparison results not only show similar trends in the positive opinions but also stronger negative attitudes on issues related to using the system for risk management amongst both senior and junior staff.

Overall then, some managers in both groups seem to dispute aspects of system's risk management function. Other managers are likely to be concerned and believe that events with unpredictable or uncontrollable factors may be hard to reduce and prevent, which is be evidenced by the higher proportions of negative responses to those questions. Moreover, some ambivalent results have arisen in the discussion of the sporadic, frequency and latent events probably because such events containing many uncertain factors may be barriers to risk management. Therefore, combining the findings above, it can be reasonably concluded that managers' opinions about using the system to manage risk are not related to their position or time spent in their departments; that is to say, their evaluations of the use of the system to manage risks and the system's functions reflect individual differences.

Figure 5.5.1.7 Likert Scale distribution relating to the use of the system to manage risk (Total Population: N=805)

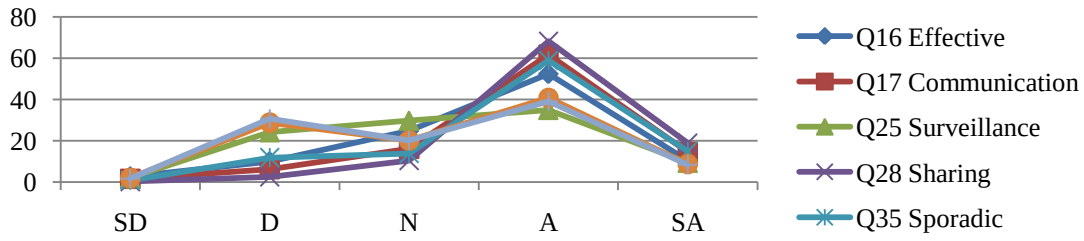


Figure 5.5.1.8 Likert Scale distribution relating to the use of the system to manage risk (Senior Staff: N =21)

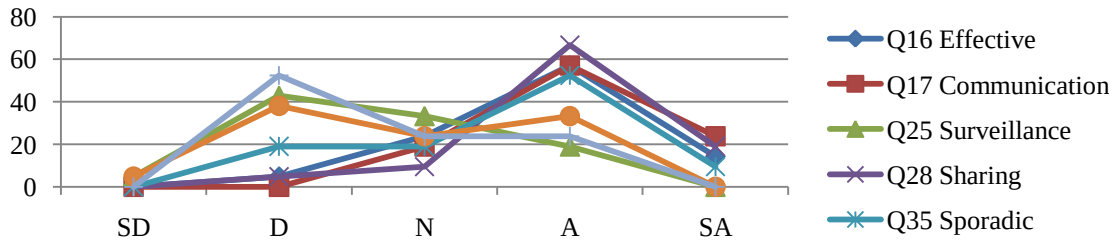
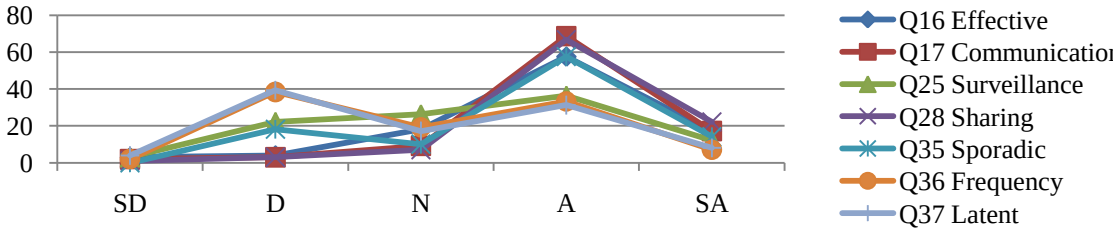


Figure 5.5.1.9 Likert Scale distribution relating to the using of system to manage risk (Junior Staff: N =99)



The next set of questions is to do with the issues of client privacy and client rights, as well as the behaviour and organizational effects caused by using the system to manage risk at school. There are six questions on these issues. Participants' attitudes towards client privacy are explored in Questions 23 (whether schools are under an obligation to protect their clients' privacy) and Question 24 (whether uploading information about events onto the system is an invasion of privacy). Question 29 addresses the impact of the system on organizational behaviour in schools, specifically, whether some managers may withhold the details of an event to protect their schools' reputations. Clients' rights are considered in Question 32 (whether schools should notify clients that an event will be reported to the CSRC), Question 33 (whether schools should notify clients' legal guardians immediately after an event have occurred) and Question 34 (whether clients and their legal guardians have a right to know the details of the reporting procedure).

Senior staff gave both positive and negative responses to the questions on privacy issues (see Table 5.5.1.7) although they were unanimous about the importance of maintaining client confidentiality. There were mixed opinions about whether sharing event information is an invasion of privacy and while some senior managers disagreed that administrative staff may be tempted to withhold particular events to protect their school's reputation, others tended to agree that the phenomenon existed at their schools. Moreover, regarding the issue of whether clients and their legal guardians have a right to be informed about the event reporting procedure, over eighty percent of the senior staff agreed with this statement. However, a few staff still held the contrary opinion on issues relating to clients' rights, especially the issue of whether schools should notify clients that an event will be sent to the CSRC. Overall, diverse opinions on privacy issues, the rights of clients and their guardians, and whether schools act to protect their

reputations were demonstrated, evidenced by the similar percentages of both attitudes expressed in the Table. Such an outcome may reflect personal viewpoints or experiences and awareness derived from managing events.

Table 5.5.1.7 Privacy issues arising from the use of the system (Senior Staff)

M=21

Privacy Issues (Senior Staff)						
Status Question / Opinion		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Rank Lieutenant Colonel Time at MTO Over 10 years Time at School Over 10 years	Q23 Protect Privacy	0	0	0	13(61.9)	8(38.1)
	Q24 Invade Privacy	0	7(33.3)	3(14.3)	10(47.6)	1(4.8)
	Q29 Reputation	1(4.8)	4(19)	7(33.3)	8(38.1)	1(4.8)
	Q32 Notification	1(4.8)	8(38.1)	3(14.3)	9(42.9)	0
	Q33 Legal Guardians	1(4.8)	2(9.5)	0	14(66.7)	4(19)
	Q34 Right	0	2(9.5)	1(4.8)	16(76.2)	2(9.5)

As for the opinions of junior staff on the issues above (see Table 5.5.1.8) around half of agreed that the transfer of personal information around the system may be an invasion of client privacy. Interestingly, twice as many junior staff (29.3%) answered "Neither" to this question (seniors = 14.3%). Over one-fifth (22.2%) denied that managers withheld the details of events to protect their schools' reputations, despite around half of the population (50.5%) acknowledging that this is probably the case. They were also less convinced about the need to notify clients when events are sent to the CSRC, although on the issue of clients' rights the results were similar to those obtained from the senior staff. In general, the juniors were more likely than seniors to give both positive and negative responses and also presented more ambivalent attitudes towards the use of the system for managing risk, particularly on the issues of privacy and clients' rights. Therefore, it may be worth examining these results more closely and I will be attempting to do this in the next chapter with the qualitative data.

Table 5.5.1.8 Result showing the privacy issues of using the system (Junior Staff)

M=99

Manage Risk of Using System with Junior Staff						
Status Question / Opinion		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Rank Major Time at MTO Under 2 years Time at School Under 2 years	Q23 Protect Privacy	0	1(1)	1	51(51.5)	46(46.5
	Q24 Invade Privacy	1(1)	14(14.1)	29(29.3)	42(42.4)	13(13.1)
	Q29 Reputation	5(5.1)	17(17.2)	27(27.3)	43(43.4)	7(7.1)
	Q32 Notification	4(4)	30(30.3)	26(26.3)	29(29.3)	10(10.1)
	Q33 Legal Guardians	0	1(1)	4(4)	59(59.6)	35(35.4)
	Q34 Right	0	3(3)	11(11.1)	63(63.6)	22(22.2)

The next step is to compare the responses above with the overall results on this set of questions (see Figure 5.5.1.10, 5.5.1.11 and 5.5.1.12). From the diagrams below it can be seen that multiple opinions were presented by the total population as well as the

more senior and more junior staff on both positive and negative attitudes. This suggests that most managers are likely to be torn between protecting clients' privacy and using the system for risk management. It is also worth noting that the most negative and the most positive attitudes are expressed by more senior staff; while, the discussion of the clients' privacy/rights issues presents many different patterns across the three population groups.

Figure 5.5.1.10 Likert Scale distribution relating to the privacy issues of Using System (Total Population: N=805)

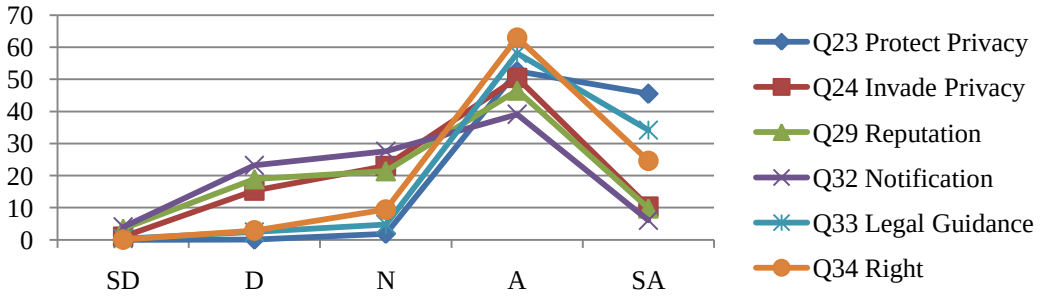


Figure 5.5.1.11 Likert Scale distribution relating to the privacy issues of Using System (Senior Staff: N=21)

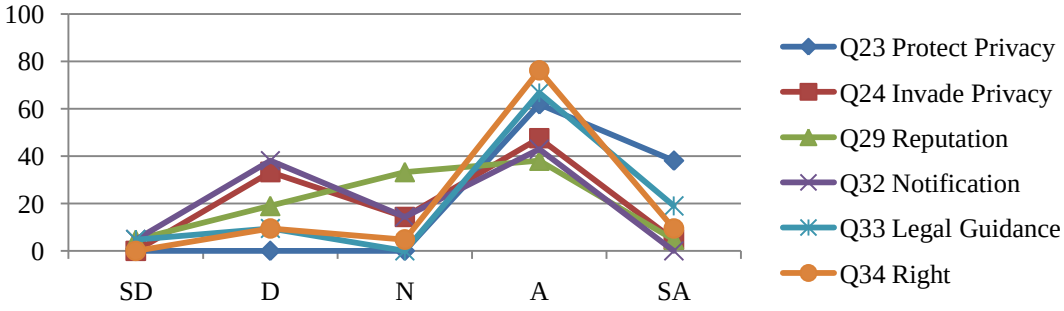
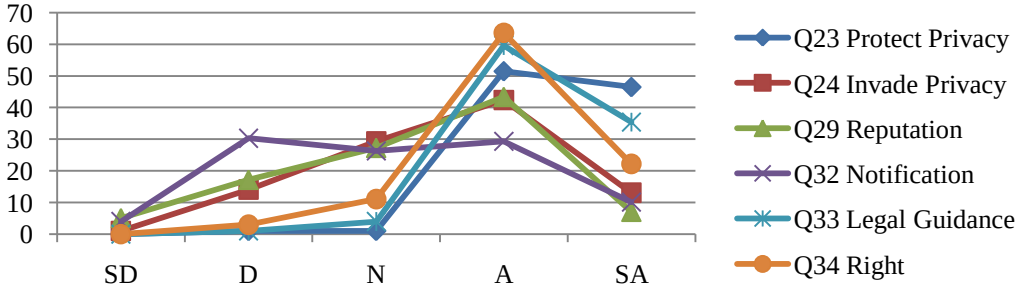


Figure 5.5.1.12 Likert Scale distribution relating to the privacy issues of Using System (Junior Staff: N=99)



In conclusion, in this section I filtered two extreme samples from the total population according to military rank and seniority in the MOT and current department (the more senior and junior staff). I then measured their opinions on four new groups of issues, which are classified according to the similar attribution, and contrasted the result with the total population. On the one hand, when "evaluating" the use of the system or the "obligations/expectations" of schools, the three population groups express similar opinions irrespective of seniority. Such outcomes can be interpreted as evidence that managers' attitudes towards the system's functions and the obligations of the organization are not affected by position or status, or time served at a department. On the other hand, in their responses to questions about using the system for risk management and maintaining clients' privacy, the participants seem to demonstrate diverse attitudes toward these issues. Some managers are in complete agreement with the statements, whereas others are strongly opposed, while some remain neutral. Underlying these differences in opinion might be the participants' different personal experiences of dealing with privacy/rights issues and the risk management task.

Regarding issues related to the use of the system for risk management, most managers seem to be satisfied with the system's utility function and operating procedures for managing events. However, on the issue in relation to reporting action, this may affect organisations, such as the temporary concealment of events for the sake of schools' reputations, both groups of managers as well as the total population present more negative attitudes on the system management function. It would be reasonable to assume that organisatuion culture and attitude toward events, probably influence and impact on managers' judgment, awareness or values on this issue. It seems that some conflicts have confused managers on the priority between organizational discipline and personal valuation when they manage events. For example, the results suggest that many managers believe the system has a surveillance function; therefore, they may be reluctant to report events so avoiding possible sanction or withhold an event to protect the schools' reputation.

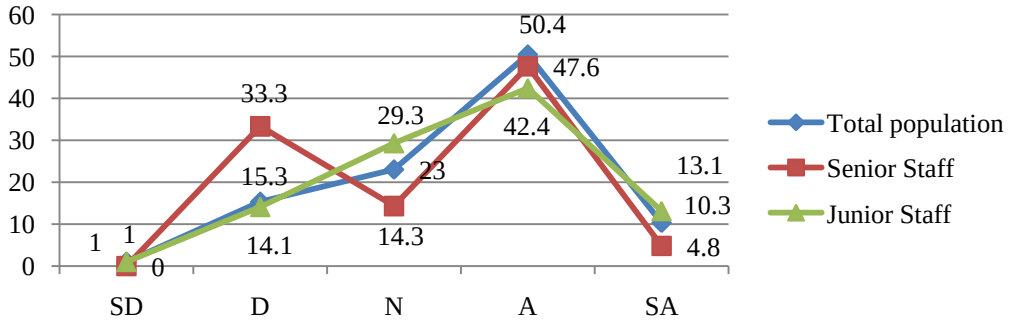
Obviously, these phenomena and influences may interact with each other and, consequently, create increasing uncertainty. This, in turn, undermines the effectiveness of the system in terms of managing risks. The exploration of privacy issues shows that some managers are ambivalent regarding the importance of personal privacy or clients' right. Indeed, when managing risks that appear to contain more uncertain/unpredictable

factors which may have a possible impact on organisational reputation or the clients' privacy, managers' judgement, evaluation and management attitudes seem to be important factors shaping how these risks are addressed. In reality, it is difficult to determine where the boundary between organizational discipline and clients' right/privacy should lie, because the perception of these two risks may differ from person to person. Indeed, parts of the data on managers' judgments and views on the using of the system for risk management have manifested both the positive and negative attitudes. Therefore, in the following discussion I will pick out some issues with different or significant patterns and other questions which may be classified as controversial issues for risk management at organizations, and discuss them in detail. By doing so, I hope to highlight and present other diverse trends and patterns to help explain and understand some common concepts of the using of the system for risk management.

5.5.2 Alternative patterns among the senior and junior staff and total population

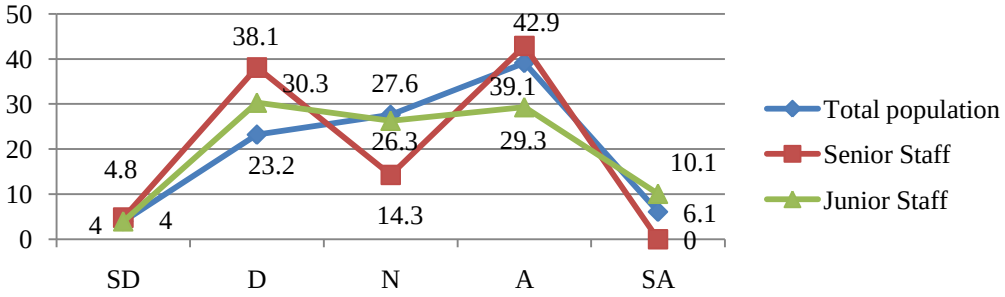
The previous section drew attention to the diversity within the data by comparing opinions of two particular levels of samples on the four groups of issues with those of the total population. In this section, some issues with particular results or patterns have been selected for further discussion. Firstly, there is the issue whether a client's personal privacy is invaded by the process of information exchange and how this compares across the three population groups (see Figure 5.5.2.1). As can be seen, the results show similar trends in the opinions of both the total population and the more junior staff. The positive attitudes of the senior staff (47.6%) and the total population (50.4%) are also quite close together. However, the negative responses of senior staff (33.3%) are nearly double those of the total population (15.3%) and the junior staff (14.1%).

Figure 5.5.2.1 Likert Scale distribution relating to whether reporting events may invade clients' privacy across Total Population, Senior and Junior Staff



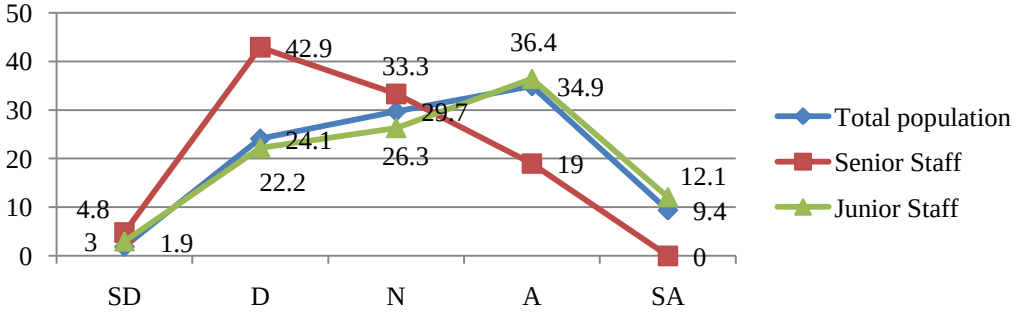
The second issue where opinions diverge significantly is whether a school should notify a client that an event will be sent to the CSRC (see Figure 5.5.2.2). Senior staff is both more positive (42.9%) and more negative (38.1%) about this issue than the other two population groups. Only 14.3% of senior staff chose "Neither" to represent their opinions on this issue, about half as many as in the total population (27.6%) and junior staff (26.3%). Moreover, it is interesting to note that similar proportions of junior staff expressed negative (30.3%) and positive (29.3%) attitudes as well.

Figure 5.5.2.2 Likert Scale distribution relating to whether schools should notify clients that an event will be sent to the CSRC across Total Population, Senior and Junior Staff



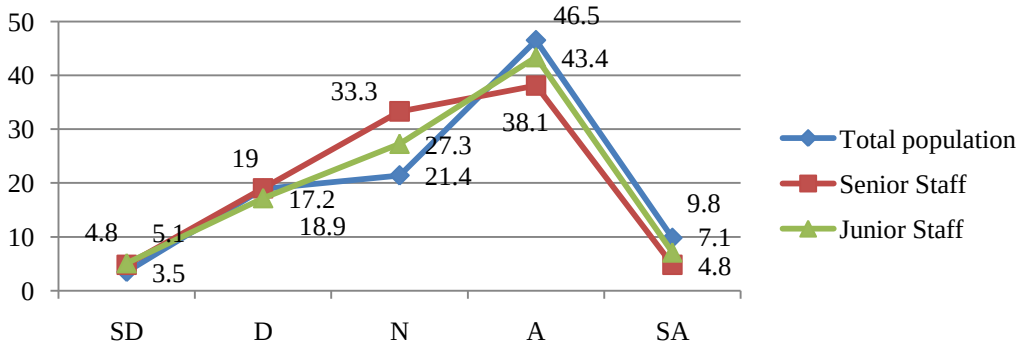
On issues that may be related to risk management in hierarchical organisations, one relevant result is that to do with the system's surveillance function (see Figure 5.5.2.3). The 'negative' attitude was most common amongst senior staff (42.9%) with significantly fewer 'neither' (33.3%) and 'positives' (19%). Junior staff and the total population were more positive about this, with over one-third (total 36.4% and junior 34.9%) agreeing with the statement that one of the system's functions is to monitor schools, with just 24.1% and 22.2% 'negatives' respectively; around one-third of seniors (33.3%) chose 'neither'. Finally, it may be worth noting that the proportions of junior staff are similar to that of the total population across five scales of attitude.

Figure 5.5.2.3 Likert Scale distribution relating to the system surveillance function of monitoring schools across Total Population, Senior and Junior Staff



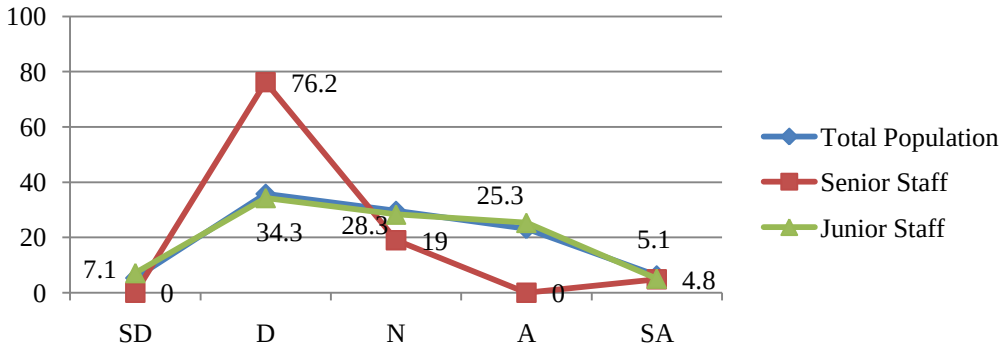
With respect to invisible phenomena in schools and the question about whether some managers may withhold events to protect schools' reputations, from the results obtained from the three populations (see Figure 5.5.2.4) it can be seen that between one-fifth and one-third (21% and 33.3%) of participants do not see this issue as important, but managers across the population groups seem to agree that it happens in their current schools, evidenced by positive results of over/around 50%.

Figure 5.5.2.4 Likert Scale distribution relating to the protection of a school's reputation by withholding events across Total Population, Senior and Junior Staff



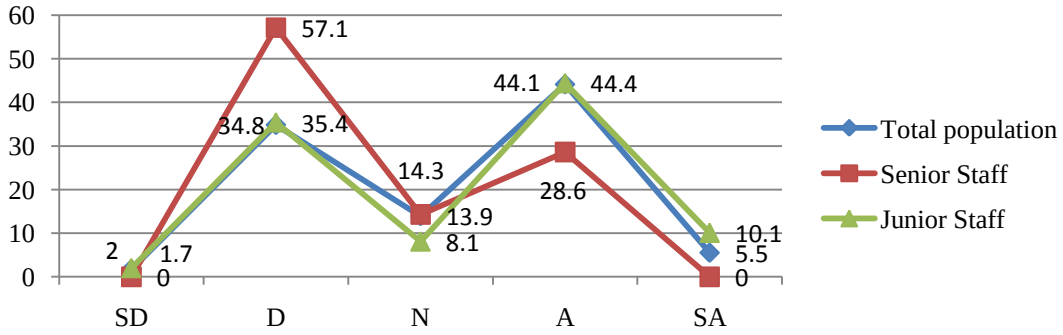
Finally, there are two questions that have not yet been discussed in this section because of their unique characteristics and attribution. One was designed to explore the change in the organizational dynamic when dealing with risk, the other relates to the particular characteristics or personalities of clients. The first question addresses the issue of whether the organizational dynamic might be altered by hostile reactions to event reporters from colleagues when the system manager reports events to the educational management regime: the results are presented by population group in Figure 5.5.2.5. As can be seen, senior staff most strongly disagreed with the suggestion that relationships between event reporters and their colleagues might be strained, with over three quarters answering in the negative (76.2%); just one-third of the total population and junior staff (around 34.3%) disagreed and around a quarter of the total population and junior staff (about 25.3%) agreed with the suggestion.

Figure 5.5.2.5 Likert Scale distribution relating to whether reporting events may make colleagues hostile to managers across Total Population, Senior and Junior Staff



On the issue of whether events happen to particular types or groups of student, the results to which are presented by population group in Figure 5.5.2.6, the majority of senior staff (57.1%) disagreed with this suggestion and 28.6% agreed. The total population and junior staff scores were also high and of a similar proportion, for both positive attitudes (44.1% and 44.4% respectively) and negative (34.5% and 35.4% respectively). Senior staff is less convinced than the total population and junior staff that events normally happen to particular groups of students.

Figure 5.5.2.6 Likert Scale distribution relating to whether events usually happen to particular groups of students across Total Population, Senior and Junior Staff



I will now divide and integrate all questions with similar attributions and characteristics into four groups – evaluations of using the system: obligations and expectations of the system; the basic concept of risk management employed when using the system; and privacy and clients' rights issues in relation to the using of the system. These particular groups will then be compared against two specific groups of samples, which are the more senior and more junior staff selected from the total population.

Generally speaking, it is hard to distinguish a significant difference in the discussion

regarding the evaluation of system procedure/function and the responsibilities, obligations/expectations of schools and organizational regimes in the responses of the more senior and more junior staff compared with the total population. However, it can nevertheless be seen that the senior staff are more likely than the junior ones and the total population to present multiple attitudes on the issues in relation to the using of the system for risk management and the privacy and rights of clients; such phenomena may be evidenced by the diverse trends and patterns of results when contrasting between the senior staff and other two populations. For example, some seniors seem to be more confident than their junior counterparts about using the system for risk management, even given the possibility of hostility from colleagues or infringements of personal privacy. Other seniors also express more positive attitudes than juniors on issues relating to clients' rights, such as the necessity of notifying the client's legal guardian. It seems that senior staff are more likely than other staff to agree with the system' surveillance function and the clients' right to be informed about the event-reporting procedure. The results also demonstrate that the attitudes of the junior managers towards the four new groups are broadly the same as the total population.

Obviously, some significant differences in participants' attitudes can be seen by contrasting between two particular samples and the total population. It seems that the participants' attitudes toward different issues may be influenced by their personal experiences of dealing with events or the length of time they have served at their current school, and even their job position. Therefore, it is worth considering the potential problems facing organizations; answers may be obtained from different levels of managers. Studying and collecting such information may provide more evidence to explain the ambivalence amongst each group of managers, as well as help to distinguish the balances and boundaries between the organizational discipline to manage risk and managers' self-awareness/judgments of using the system for risk management.

5.6 Conclusion

The purpose of this chapter has been not only to examine participants' attitudes towards the system's utility functions, the organizational obligations and the rights/privacy of clients but also to explore some potential or possible problems that probably exist at local schools and already influence organizational dynamics and managers' attitudes toward dealing with events. The statistical results of mean value and standard deviation

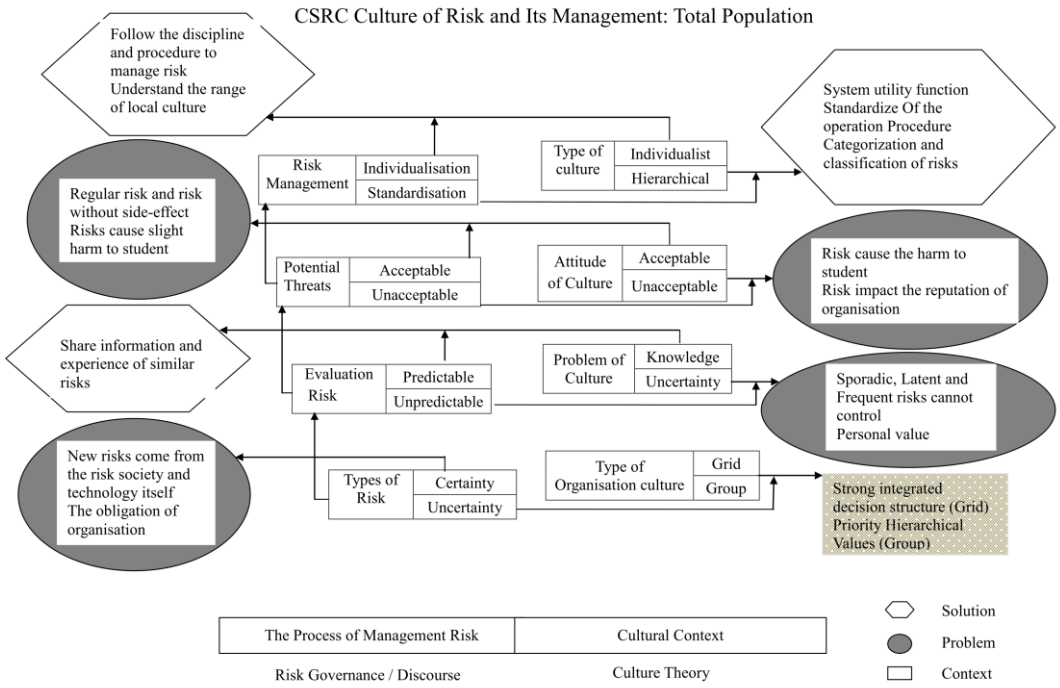
present participants' general concepts and opinions on the multiple issues about the operation of the system measured against each independent variable. The independent t-test helps highlight participants' different attitudes towards the system while one way analysis of variance (ANOVA) was used to demonstrate more significant patterns and show the influence of participants' seniority and position, and attitudes reflecting academic and military training. The contrasts between particular groups of samples and the total population demonstrate some significant trends and such findings may be understood as revealing the broad attitudes of managers towards the use of a technical management system, as well as the general behaviours or dynamic that exists at the organisational culture level.

The establishing of the CSRS is likely to construct and develop a utility management system for controlling and preventing possible or potential threats which may harm people or cause the loss of property at the educational institutions. From a SCOT point of view, the utility of a technical system not only is reflected in the way it is managed but the system may also has to solve and consider some potential problems which prevail within the organizational culture. By doing so, the system's function could be made more acceptable to most of its operators, as a "socially robust" process. Indeed, in discussing results in the previous sections it was found that most system operators tended to agree with the management and prevention functions of the system; however, some concerns and invisible behaviours also existed at most of the local schools. I will now attempt to integrate the perspectives into the three main population groups – the total population, senior staff and junior staff, understanding the process of risk management within a cultural context from within the SCOT perspective.

Firstly, the broad opinions of the total population towards managing risk and organizational culture are linked and shown in Diagram 5.6.1. According to the diagram four stages have to be negotiated in the process of risk management. In a high grid/group organizational culture, the first step is to distinguish the type of risks threatening the organization, which can also be conceived in terms of certainty and uncertainty. To manage these risks, the organization as a whole will not only need to be able to control and predict dangers but must also reduce the uncertainties and unpredictability generated by risk. After this has been achieved, the risk assessment might move on to which potential threats are acceptable or unacceptable given the current organizational culture. Finally, in a hierarchical organization, the main task of

risk management may be to establish a standardization procedure to manage and handle events, which may be one way of avoiding the influence of individual judgment.

Diagram 5.6.1 The CSRC culture of risk and its management: Total Population



As the rectangle shows on the bottom right of the diagram, the management framing of the CSRC probably constructs a strong integrative decision structure. The priority here reflects the values of the organization within a hierarchical culture, where system managers try to reduce or avoid any uncertainty risks impacting on the organization. Indeed, most participants tend to agree with the system's utility function, they seem to believe that the standardization of operating procedures, categorization and classification of risks may be a systematic and effective solution to controlling and handling risks; they are not only following the standard procedures to operate the system but are also beginning to understand that new risks will sometimes come from a risk society and the technical system itself, shown on the bottom left hexagon. Therefore, they will be more likely to accept that dealing with risks is an obligation of the organization. With respect to this, the evidence shows that over three quarters of the participants believe the system is an effective channel/function for transferring information and helping to handle/manage events; and over ninety percent of participants believe that schools have an obligation to deal with events.

Regarding the second stage of context, the majority of participants seem to agree that the evaluation of risks can be improved by sharing information and experiences. Most participants seem to believe that through the interchange of knowledge risks can be made more predictable. The system therefore arguably improves managers' ability to partly overcome the limitations of risk assessment and predict some uncertain risks; some scepticism and problems may also arise if events contain many uncertainties, for example, sporadic, high frequent and latent events, and participant attitudes towards such events may differ from each other. For example, city managers and heads of departments are more likely than most school staff to believe that the system may empower the abilities of prediction and prevention of events in the use of the system because they may carry more responsibilities on handling events within educational regimes. It seems that the more responsibilities the managers take on, the more they have positive attitudes towards the control and prevention of risks. Also, the results show that around quarter of the participants never receive analysis reports or results. Clearly, although predicting abilities can be improved by the understanding of similar events, without the exchange of information the prevention function of the system cannot be fully operationalized.

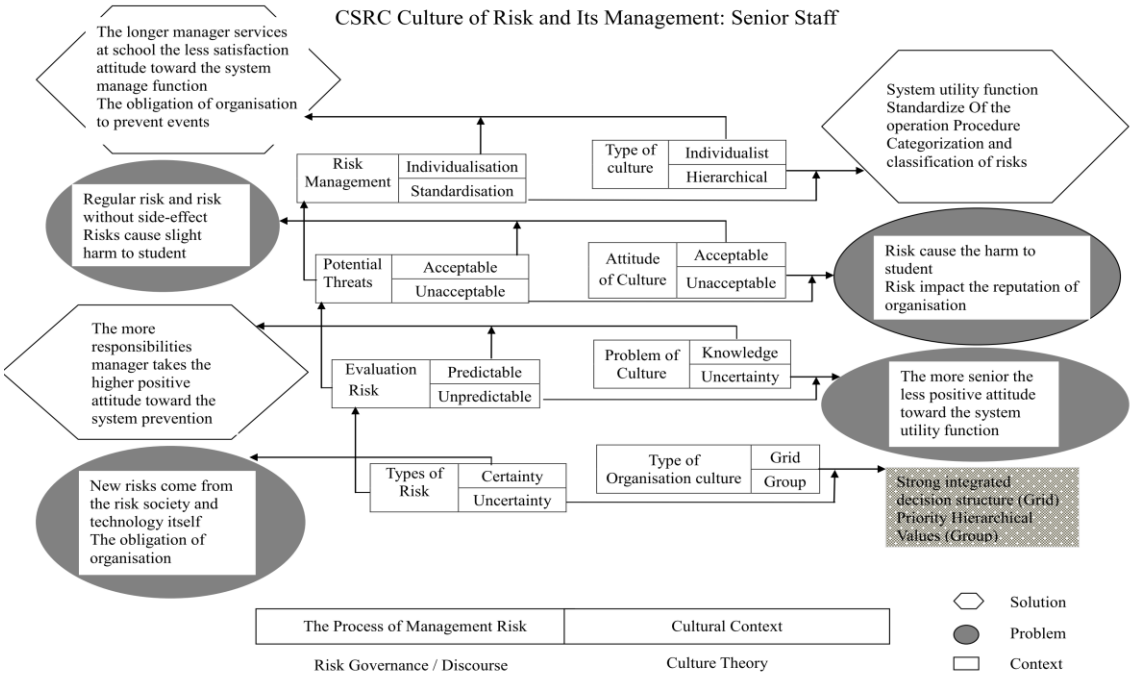
Moving on to the third stage of context which discusses potential threat and attitude toward school culture, most of the participants accept the existence of potential threats with few or no side-effects, but nevertheless feel that such risks are unacceptable. This is shown by the overwhelmingly positive attitudes towards placing security above study in schools. Moreover, according to CSRS regulations, any event on the system's list must be reported to the CSRC through the system and updated if necessary, following the system's standard operating procedures, which is a kind of disciplinary obedience. However, in practice, it seems likely that if events relate to organizational reputation or may impact on the organization in other ways, managers' attitudes towards the system management function may change and the events will be withheld, leading to an under-reporting of incidents. Indeed, the choice of which risk to worry about may depend on how priorities of the local organizational culture and interests of the organisation as a whole are determined.

The fourth stage (the highest line on the Diagram above) of context which examines risk management task and type of culture, optimum efficiency, at the highest level of educational institutions managers have not only established a utility system to

communicate and discourse with schools but have also developed a standard procedure to handle and manage events that are unacceptable to organizations. The data suggests that most managers will tend to comply with disciplinary procedures when handling routine and repeat events, and seem to accept and agree with most of the management and operation functions of the system. Such outcomes highlight the fact that, in order to manage risk, standardisation may take precedence over individualization in a specific socio-technical context.

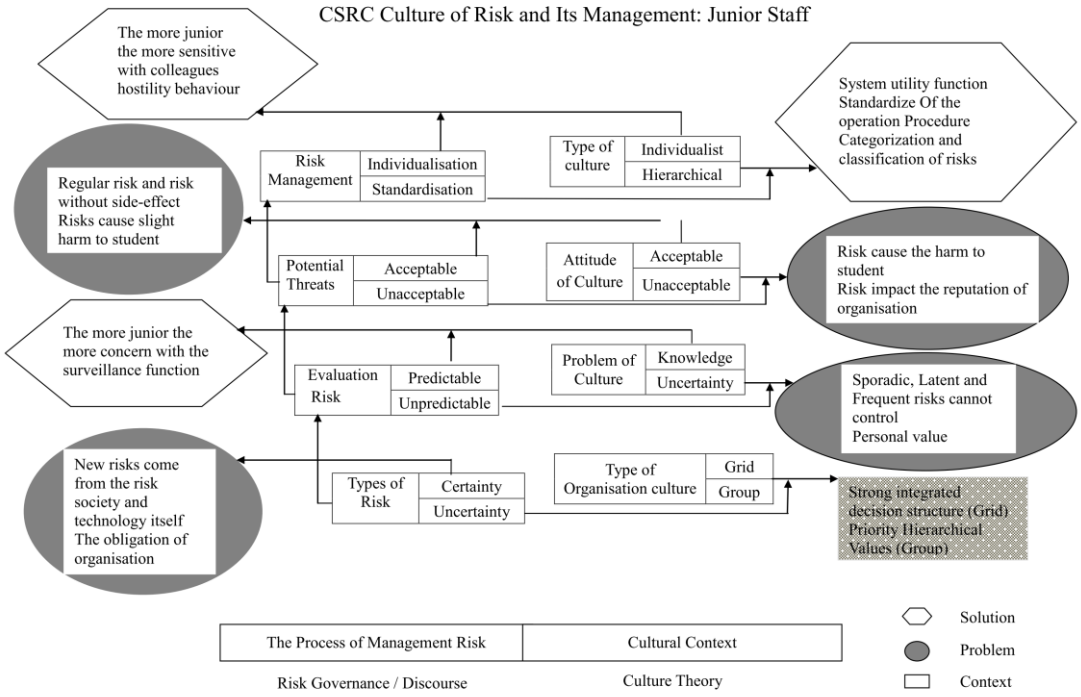
Indeed, the opinions of the total population presented and demonstrated some general concepts and attitudes towards the system management function; however, it is unlikely that the invisible interactions and behaviours inside the organizational dynamic will be identified by analysing the broad conceptions of the participants as a whole, because such imperceptible factors and causalities may relate more to personal values or the moral judgments of managers themselves, and internal pressure from other colleagues and the organizational culture. Such interactions might instead be discerned from the senior staff group (see Diagram 5.6.2), others may be distinguished amongst the opinions of junior staff (see Diagram 5.6.3). As can be seen in the Diagram 5.6.2, despite the three problems that could be found, which are shown on the two sides of the ellipse with shadow columns, most of the opinions and attitudes toward the risk management function of the CSRC are similar, apart from the contrast in the results of senior staff to total population. It seems that the more responsibilities managers take on the more positive their attitude towards the prevention of risks. For example, city managers and heads of departments are less likely than most school staff to express negative attitudes on issues related to the prediction and prevention of events in the use of the system. However, if the risks contain many uncertainty factors, seniors, who have also been serving at their schools longer than juniors, may present less positive attitudes toward the system utility function. Heads of department, for example, presented less positive attitudes than other staff towards the prevention of sporadic, frequency and latent events.

Diagram 5.6.2 The CSRC culture of risk and its management: Senior Staff



Finally, the discussion of junior staffs' opinions revealed similar patterns to the opinions of the total population when it came to using the system (see Diagram 5.6.3). However, two particular phenomena may be worth noting: regarding the use of the system to control risks, juniors were not only more concerned with the system's surveillance function but also appeared to be more sensitised to colleagues' hostility behaviour at school. It seems reasonable to conclude that there is a degree of ambivalence about the system, which causes managers to oscillate between their subjective judgments of how best to protecting organizational reputations and their objective evaluation of using the system for event management. As Douglas and Wildavsky suggest, science and technology cannot by themselves determine the threats in regard to moral or cultural issues because it is society itself that makes the decision of what risk is (Douglas & Wildavsky 1982: 81).

Diagram 5.6.3 The CSRC culture of risk and its management: Junior Staff



In this chapter, the broad attitudes of participants towards the systems functions have been explored through the use of statistical methods and some potential phenomena/behaviour have been highlighted, as well the interaction in local organizations (schools). Significantly, some contrary attitudes and ambivalent behaviours seem to arise from the exploration and discoveries of some controversial issues within the comparison of contrasting samples. In hierarchical organisations, one of the best ways for managing and dealing with risks/events may be to follow the standard operating procedure. As can be seen, nearly one-fifth of managers claimed to have received no information about the purpose of the system design and one quarter do not receive reports from the CSRC; most seem still to support the system's utility and function. In risk society, the use of the system for risk management may generate new risks from within the system itself, which may explain some of the disagreements and debates amongst managers over the functioning of the system. In a high grid/group organisational culture, it is likely that managers will not only comply with the disciplines and regulations of the organisation in a high grid/group management structure but will also confront and engage in behaviour which deviates from this. My quantitative results seem to show that some local sub-cultures influenced some staff to

deal with risk in their own way. As I highlighted in the previous section, for example, some operators not only focuses on the management of risk but also concerns they have about *reputation management – which in one sense poses an even greater risk than the events they report*; however, such conflicting phenomena are unlikely to be explained, let alone discovered through quantitative data alone. This matter of reputational risk draws attention to the ways wider social risks are created by the system, and ones that are not within the system itself. They are probably hidden in the local organizational culture and experienced by some of the system operators. Therefore, it may be important to be interesting to explore the priorities and judgements of managers: is it the management of events with standardised objective values or the protection of organizational reputation that is more significant with subjective valuation? In the next chapter consequently I will explore the interpretations and perceptions of how the educational regime develops a technical system to manage risk, and whether there are another problems existing within an organisation as a result of this. I will deploy qualitative research, relying on face to face interviews, among system designers/managers, city/county managers and school staffs which may help to uncover how managers reconcile event management and local organisational practices.

Chapter 6 The system in practice: local operators and system designers

6.1 Introduction

The previous chapter explored managers' attitudes towards the functions of the CSRS and their experiences of using the system to manage campus events. Significantly, most of the managers are likely to approve of the system management function in its dealing with events, as shown by the statistical results of my quantitative survey. Nevertheless, some participants' attitudes appeared to vary on issues related to the organisational culture. Some of their attitudes are likely to be influenced by personal values about the rights and privacy of clients, and some may be affected by the sub-culture of the organisation, such as the hostility towards system operators from other colleagues at schools. Others, such as heads of departments and city managers, were, more than general staff, likely to be worried about how to manage events more effectively. Such diverse views which existed across managers from different backgrounds are hidden inside of the organisation and are difficult to explore within the hierarchical culture in the schools, using simply a survey technique.

While some phenomena have been discovered by analysing the statistical results of the survey data, such figures and the trends observed are probably not enough to explain the dynamics of and interaction within the organisations in question. Therefore, in order to explore the opinions and practical experiences of managers operating the system in more detail, this chapter reports on a more qualitative set of data derived via in-depth interview. The subset of respondents is drawn from the managers, from those senior staff at the centre of the CSRC to those in the local school, who actually operate the system. These managers are classified into three groups by their position and responsibility within the management framework of the system: system operators in schools; system managers of the educational sector at the city/county level; and managers charged with designing and managing the system at the government level.

In this chapter, qualitative research methods are adopted to explore the interaction between operators and managers, and analysis of the data collected by the semi-structured interviews. Denzin and Lincoln (2008: 16, after Becker, 1996) argue that there are five main differences between qualitative and quantitative research. These relate to the use of positivism and post-positivism, acceptance of postmodern sensibilities, capturing the individual's point of view, examining the constraints of

everyday life, and securing rich descriptions. However, the two approaches are not mutually exclusive and qualitative research can be used to enhance quantitative analysis, for example, by unpicking, explaining or accounting for otherwise hidden mechanisms and making key variables more measureable or hermeneutically. Its analytical function may even help to uncover potential relationships between and invisible influences over each individual variable or sub-sample, or examine the effect of clusters of related variables (Rosaline 2008:11).

The purpose of this chapter then is not only to investigate the visible phenomena and debates relating to the personal values of participants and their organisational sub-cultures, themes which were explored in previous chapters, but also to consider the possible gaps in the system at the government level, policy practitioner at city/county level and school staff. There are three main aims here: firstly, to establish precisely which events are acceptable and unacceptable for different levels of managers; secondly, to define where the boundary between organisational culture and administrative discipline lies when managers deal with events; and thirdly to understand how managers established, in practice, the order of priority between organisational reputation/benefit and risk management itself. In the following section, I will describe my fieldwork and how the data were collected, and present the results of analyses of the findings. I have arranged the results according to three main topics which examine: how an educational regime develops a technical system to manage risk; operating a technical management system according to organizational and personal perspectives; and how are potential problems involved in influencing the modification of a technical system through multiple factors existing inside and outside of the organization.

6.2 Fieldwork and data collection

The data collection process involved conducting 34 semi-structured interviews with designers, managers and operators of the system between 8th July and 31st August 2009 (see Table 6.2.1).[2] The respondents were chosen to reflect the different levels of managers and operators (i.e. designers and managers of the CSRS at governmental level, policy practitioners at city/county management level, and school managers at the local level) as well as the views of both general staff and heads of department at the city/county and school levels. As a consequence, the interviewees were from five

[2] The research design and issues to do with the questions asked have already been considered in the methodology chapter.

different cities/counties located in the middle, north and south of Taiwan. In addition, the respondents also contain some staff who volunteered to participate in the interviews.

Table 6.2.1 The background and distribution of interviewees

Code	Personal Background of Interviewees	Number of Respondents
S	Campus Security Report Centre	System designer * 2
M	Manager of CSRS	CSRS manager * 1
	Manager of Taiwanese Province	Middle-level manager *1
A	Head of City or County	5 Respondents (1 is also a Designer)
B	Manager at City or County Level	5 Respondents
C	Head of Department at High School	5 Respondents
D	Senior Staff at Department (over 5 years)	5 Respondents
E	Junior Staff at Department (less than 2 years)	8 Respondents
V	Volunteer	3 Respondents
	Total	34 Respondents
Note: in the following quotations from the interviews, shown within quotation marks, the use of 'number with code' is to substitute for the personal background or job title of the interviewee and so anonymise the data set.		

In order to collect information from a diverse subset of system managers to operators, two distinct schedules were used in the semi-structured interviews. One was for the designers and managers of the system, people who are not only at the top of management framework but also helped to establish the system and have to manage it and make the policies for risk governance. The questions for this group explored the design concept behind the system, their risk management experiences, opinions about the system's functions, training programme and the education available for users, the effect and utility of analyses of the recorded database and the problem of using a technological system for managing events.

The other interview schedule was for two types of participants, general staff and the heads of departments at local high schools or city/county level. The questions for this group were mainly about the system's development e.g. operating the system, dealing with events, opinions on operational procedure and the potential problems of using the system, and the actual application of system information e.g. the protection of clients' rights, the new events accompanying the use of a technical system, and so on.

All the interviews were captured by a digital recorder. The files were transcribed in Chinese and coded independently, with the help of AtlasTi-5 and NVivo-9 software, and then the coded data was translated into English (see Appendix X). The results are expected to contrast and distinguish possible differences or gaps between managers/designers and local managers/operators of the system.

6.3 The development of a system for managing risk within a hierarchical organisation

In the previous chapter, I considered how the categories and classification of events in the CSRS have been modified several times to make them as comprehensive as possible because of the increase of diverse events that might be created by new types of social phenomena or major events, influenced perhaps by imitation of peers such as street car racing and illicit drug abuse.

An enormous amount of data has been collected by the system over the past ten years or so. It is therefore interesting to explore how a technical management system works in practice in an educational regime. Hughes (1989: 51) points out that some factors may be built into the design of a technical system – including messy, complex and problem-solving components; therefore, both "social construction" and "social shaping" should be taken into consideration (Williams and Edge 1996: 54). In this section, therefore, I will explore the occasion of establishing a technical management system and its function for managing risk in hierarchical regimes.

In Chapter Four, I discussed the fact that natural disasters such as earthquakes or typhoons happen quite frequently in Taiwan and often cause serious damage to people or property. Although with modern technology these types of events can often be predicted, such occurrences are still fraught with uncertainty and usually happen too quickly for people to be evacuated from the danger zone. In order to control the level of casualties and the loss of property, most governments have contingency plans for managing the threats posed to their countries by natural (as well as man-made) disasters, via diverse communication technologies:

> '…originally, the responsibility for reporting was with the Department of XXX, and the events were reported via paper and telephone. We hope the reporting procedure will be more online and digital when the duty passes to the Department of Military Training Education from the XXX Department…' S2

As S2 highlights, a predecessor's managing process relied on paperwork and the telephone to report events occurring within the educational regime. The process of translating and handling information is a feature of more or less all organisations,

regardless of the media used. However, the excerpt above raises two issues: why the responsibility for risk management was transferred from the XXX department to the Department of Military Training Education and whether there were any particular reasons causing the transfer of duty which managed the campus security events at educational organisations. If so, it may be worth exploring the kind of the motive causing changes in the responsibilities within the bureaucrat regime. As was highlighted in the previous chapter, there are many staff working in educational institutions in Taiwan, from high schools to universities, with military backgrounds who are responsible for campus security. The management framing of the CSRC seems to fit best with Douglas's high group/ grid risk management culture (Douglas 1978: 7). One of the functions of the system is to transfer information about events from local schools to governmental management centres immediately, whether the emergent events were caused by students or natural disasters. Without a high degree of cooperation and team work, and importantly, conformity to an organisational culture, it would be extremely difficult to achieve such a goal. In relation to this, it would appear that the original conceptualisation and design of the system was similar to that of military intelligence gathering. The excerpt below tends to support this viewpoint:

> '…the concept of the system may be from the military, because most of the military training instructors are from the military. This system (CSRS) may be an extension of the reporting system used within intelligence services and the information system used in the military and the spirit of the military reporting system extended to schools…' A2

Most of the operators at school level and managers at local government level believe that the inspiration for the system was the military. Indeed, the response of one of the system designers probably highlights some aspects of the basic construction underlying the passage of information from local school to the management centre and the governance framing of risk management at educational regimes:

> '…the system is like radar in the Navy, local radar is used for detecting information….. Then this transfers the information to the middle radar centre…. the information then is transferred to the operation centre…..Actually, it is a kind of distributive construction and centralizing management… ' S2

While it might have been an imitation of a management framing in the military and related to the principle of radar system for integrating information, as S2 suggests, this does not tell us the reason *why* the educational institutions decided to develop a new and more technical system for handling events, to replace the existing and less technical system. What was the major occasion which gave birth to the system? The excerpt below from another system designer hints at the factors that may have brought about the system:

> '…there was a typhoon called "Nari" around 2000. We sent a notice to schools but we found that the whole city was flooded, and a power failure was caused in Taipei. So schools could not report the condition, either by internet or by Fax. …..the Minister asked every department for information about the disaster urgently. ……. None of the departments, not even the XXX Department [the department originally responsible for overseeing reporting] could provide any information, except us. Where were the resources of information from? I was the duty officer at the time. The director of the Department, [whose military background was Lieutenant General] asked me to think about what communication method I could use. I used the method of "Sound Indication", [a kind of alternative method for communication such as use of sound or light and flag signal etc]. So I separated staff into several groups and designated them to different schools for understanding the latest condition of the schools, and asked them to report it to the management centre. In the disaster prevention meeting, we were the only unit providing the latest information, which made the superiors think that the Department of Military Training Education was capable of collecting first-hand information of a disaster and transferred the reporting responsibility to our Department from the XXX department"…' S1 (A1)

It seems that the major event giving birth to the system was a natural disaster, the unpredictable consequences of which exposed the inadequacies of the original reporting method. As I pointed out in the literature chapter, in Chinese, the concept and the meaning of the word for 'risk' incorporates both danger and opportunity. Although Typhoon Nari caused some destruction and much confusion, it also hastened the establishment of a technical management system. The alternative method of "Sound

Indication" shows how managers relied on their professional knowledge and experience to deal with such events, when the original reporting methods failed and the situation got out of hand. It seems reasonable to infer that an organisation with a high group and grid management culture will be more effective at dealing with most messy and complex situations, when an unpredictable event challenges the original organisational order. This was recognised by the internal government reshuffle and removal of management responsibility from the XXX department to the Department of Military Training Education. In addition, the development of a technical management system probably not only provided a utility function for organisations to control other similar disasters but also improves managers' ability to distinguish the true nature of an event. These functions of the system are evident in the opinions expressed by system managers and policy practitioners at the top and middle levels of the management framework, who:

> '…can understand the real damage on campus clearly and plainly…' M1

Understanding and handling developing events is bound to be a priority for most managers responsible for campus security, who have not only to deal with any situations that arise but must also interpret and collect information about the event in a prescribed fashion. Despite the ease of disseminating information through contemporary media, most governmental organizations still have to clarify the meaning of this information for themselves. Therefore, one function of the system seems to be to solve this problem, which is confirmed by the following comment:

> '…although the information and media are well developed…….actually sometimes the information from the media may not show the truth, we have to clarify the information through the system…' M2

As far as risk management is concerned, relying on outside information received from outside sources is problematic because such information might be exaggerated or come from the second-hand material, which may expose organizations to some unacceptable side-effects or additional harm. As the exploration in the previous chapter shows, managers' viewpoints of the system's function may change with their position or responsibilities for managing risks. Such phenomena also seem to be supported by the following quote:

> '…When I was a junior staff, I had no idea why the Minister of Education developed such a system, which was expensive in terms of human resources and hardware equipments.……During the two years I served at the Liaison Office [which is at the city management level, similar to a city council], I came to understand the need for professionalism and an efficient communication channel for collecting information quickly, to help with risk management' B4

Judging from the opinions expressed above, it seems that managers may change their attitudes towards the system's utility function and the concept of managing risk as their responsibilities for handling events increases. However, the system's functions may not be able to cope with a sudden or unexpected increase in events due to social change or the changing behaviour of students themselves. Therefore, managers may have to improve the system's functions for dealing with new types of events; moreover, some problems may be created by the system itself.

> '…when system was modified after it finished….it was like an illegal building…add another function to the left or right…the operating of the system cannot be as smooth as originally…it is hard to modify it overall …or to destroy and re-build it…. It may cost a lot…..S1 (A1)

The excerpt above seems to point to another problem with using a technical system to manage risk in a hierarchical organization. An increase in the number of potential problems may be solved by the modification of the system's functions; however, doing this may also be detrimental to the original functions and structure of the system. If the modifications made to the system cause it to become overloaded, then managers may have to design a new system but will then have to face another problem, that of budgeting in hierarchical organizations. In the discussion above, I explained the beginning and subsequent development of the system. However, most of the descriptions were provided by system designers. I would now like to explore some viewpoints of managers at the middle management level, who operate the system in schools and report information to the CSRC for managing events.

6.3.1 Perspectives on the system: managers and operators

City managers' attitudes towards the functioning of the system seem to be based on a

broad conception of risk management – including the handling of event information, dealing with events, reconstruction/rehabilitation work following events, follow-on training and the sharing of experiences. This reflects their central position. On one hand, they are not only responsible for managing events that happen in their administrative domain but may also need to request extra resources to help schools and to improve staff's abilities to deal with events. On the other hand, as middle managers they have to transfer the information they collect to the command and control centre at the higher management level, from which they may receive more help or support. This broad conception can be seen in the quotation below.

> '…the system can transfer information about campus security to the command centre quickly....They handle the information with the help of SOPs and give orders immediately, including how to communicate, how to rescue, how to respond to the media, and how to deal with the problems. I think controlling information and dealing with the problems is the main direction of risk management...' A3

As A3 suggests, comprehensive risk management not only involves dealing with the events that occur but also collecting and controlling information before an event happens and rehabilitation after the event. The excerpt highlights the basic concept of managing risk and reminds us that sometimes dealing with the possible side-effects of events may be more important than dealing with the event itself. Events can be single cases or random occurrences, which can make them hard to deal with; however, there will be a protocol for dealing with frequent occurrences and managers may also be able to prevent or reduce reoccurring events by learning from experience. This is something emphasized by another city manager:

> '...firstly about risk management, the system not only shows the specific problem of a campus event but in fact it also describes the details of the event and the process of dealing with it at the school... it can also be the reference for a school providing some experience for the management of risks. …[The] system can provide some experience for staff who do not have experience of dealing with the event….' A2

Obviously, when managers have a wide range of responsibilities, from directing subordinates how to deal with events to transferring information to their immediate

superiors, their perspective on the system's functions of system is likely to be much broader. The system for this kind of manager is not just a means of handling, communicating or transforming the event. It also has another function, which is to accumulate experience and information about how to deal with similar events in future. The system is a point of reference for staff and this type of manager tends to see it as a means for reducing harm from similar cases, by making junior staff more aware of how to deal with risks.

So far, I have examined opinions on the system's functions from the viewpoint of the managers but I would now like to explore the opinions of the system operators working in schools. Some seem to have similar viewpoints to the city managers; others suggest that the requirements of the system for users at the local level may be different from those of managers at the governmental level. For example:

> '…it classified the campus security events in a more organized way…' C2

> '…a management from higher authorities to school …a guidance function…if schools do not have experience to deal with…..it directed information for referral…we need to centralize the manpower, resources of finance and time…it focuses on a point… ' C1

> '…it seems to provide less management function for schools but it promoted the function of managing schools for the Ministry of Education….[I]t is a good system for issuing information from top to bottom…' D2

It is reasonable to assume that local operators have both less experience and fewer resources available to them than managers at government level. As can be seen from the excerpts above, local operators tend to believe that only higher managers have the capability and resources to integrate events. Local operators simply follow the procedure and report events. They rely on the command centre to provide the necessary guidance and support, including manpower and resources. They seem to believe that the command centre has more resources, greater flexibility and knowledge necessary to help them solve most of problems. This attitude is expressed by C5 below:

> '…the front staff can properly accept guidance… they have only got limited resources and may have a biased view or opinion. The higher level

> of staff controls more resources and can use them flexibly...they may be better at coordination as well' C5

Most of the junior staff probably has little experience of dealing with emergent events; therefore, as well as a means for reporting events the system is also a channel through which they can seek help from a higher authority. It is highly unlikely that they would be able to mobilize the resources required to solve the problems created by emergent events. Thus the main function of the system for local operators seems to be to provide knowledge and resources, rather than information transfers. Junior staff will attempt to integrate them into the local management culture as well as they can when serving at the bottom of a hierarchical organization. However, understanding all regulations relating to handle events at the same time may be not easy for some staff. Some indication of why this may be the case may be found in the following answer:

> '…let educational staff know what kind of events should be reported ….otherwise they may be punished….[The system] can prevent and control…and provide an alert function…It functions as an early warning, which makes you know what problems usually happen to Senior High School students and the real situation of the school you serve. ' E3

Following the regulations to the letter as stipulated by management may be one way for junior staff to avoid punishment for not reporting events. They can also use the system as a reference resource to help them predict possible accidents. In addition, the archive of events may be a useful source of information about events which junior staff may never experience.

> '…the senior staff may not necessarily describe what happened before……we can inquire about the historical record, which is very helpful…. ' E5

As well as the functions of preventing events and avoiding punishment, for junior staff, the system seems to serve another purpose, helping them to understand and adapt to the local organisational culture. It seems that the system is a knowledge learning tool for junior staff, which not only gives information about previous events but also helps them adapt to the dynamics of the organization. Significantly, the function of the system for operators and managers depended on the way they use the system to manage risks.

Consequently, it is interesting to explore the managers' concept of handling events within the hierarchical organization, which is the focus of the next section.

6.3.2 Handling events in a hierarchical organisation

The discussion above shows that there are diverse views reflecting different manager interests and positions. I will now try to explore the different concepts of dealing with events amongst the highest managers to the lowest users in the hierarchical organisation.

There are many reasons why senior managers, at the highest levels of an organisational bureaucracy, have to control as well as understand the information they receive about events that occur within their administrative domains. They will be more concerned with helping or providing the correct information to ministers immediately than dealing with events. They will be anxious to avoid being blamed for events by legislators, the media or the general public because making a mistake in respect to risk information within the administrative system is seen as unacceptable. Handling event information for the Minister seems to be more important than the actual condition of the victim(s). Such a position is expressed in the following answer:

> '….what is the majority concern in the Ministry of Education. The concerns do not focus on how many students' died or got injured…they care more about [the question] did the minister understand the problem... will he be interrogated in parliament….did the department handle the information properly… as the XXX event… television knows…every citizen knows…but the minister did not ….[T]he minister has to handle any event immediately… he cannot avoid the interrogation of legislators or journalists….' S1 (A1)

It seems reasonable to conclude that managers' attitude towards dealing with and handling events will be influenced by the reactions of the general public, who will probably be more interested in how information is presented than the debates about how well managers dealt with an event. And, in this respect, it seems that the system has improved the ability of managers to handle events at the highest administrative organizational level. However, middle managers still have to deal with events that happen within their administrative domains, as the following suggests:

> '…the education authority is concerned about the process of dealing with events at school now. If there is inadequate information we can give guidance immediately, or give some administrative resource support' A2

So far, the exploration of managers' opinions has examined the view of senior management; now I will present some material relating to handling events with the help of the system from the observations of users. As can be seen, both positive and negative opinions towards the handling of events were expressed by system operators.

> '…we can report events quickly if the event is an emergency and or an important issue. There are two ways to do this. With important and emergency events we use the telephone to report it first; then the other is through the system…an alert function…but it depends on the cases…such as deviant behaviour or behaviour that frightens students...some events with potential problems…like the suicide of a student... you cannot observe the state of the student beforehand...' F2

Basically, two main functions of the system can be found in the viewpoints of users. Firstly, it provides a communication channel for managers between local schools and government administrative departments. Reporting all emergencies or particular events to a direct authority is an essential administrative procedure of a hierarchical organisation. The system not only provides a channel to do this but reduces the time spent doing it. Secondly, there is a prevention function as the frequency of some events can be reduced with the help of the analysis of data and greater caution regarding the frequency characteristics identified. However, if events contain many uncertainties or merely potential risk then the prevention function may be reduced. Such preventative tasks can be seen in following response.

> '…the majority is prevention…because in some months accidents will be higher than others, which can improve the effectiveness of prevention in schools if we can see the figures. Students drowning will happen in summer every year. If we publicise it two or three months before, to take extra care…it is a considerable help… ' B3

Unique events are likely at each school, in the sense that they reflect the characteristics of the students or the community the school belongs to. The point is that managers may

try to improve the system themselves, by searching for a utility function that fits the purposes of their particular organization.

> 'in the school I served at, we just used it for reporting ….it has some reduced function for disasters…but the results of statistical analysis shows a timing and information use….which helped risk management and prevention for the organization…… ' C3

Indeed, to handle events, managers need to not only understand the internal characteristics of their organizations but also to collect more information on the probable threats to the organisation. The system allows managers to send 'early warning' messages to students, who may in turn pay more attention to the potential threats being advertised and reduce the frequency of some events. Sometimes the influence and effect of the figures may be stronger than the scripts for preventing and handling events:

> '…let the figures speak, let schools know those frequency events, why they are so high…. We can take precautions against events before they happen…' B1

Despite the positive opinions of some users about the preventative function of the system, others presented negative viewpoints on it. In particular, they seemed to believe that the system is only there to help control events for the purposes of the higher management. For them, the system just offers a reporting function and does not provide any extra help or resources for school managers to deal with events.

> '…the function of management is just from top to bottom. But for us local schools unite; it did not provide positive help for the basic level of school….'F6

Significantly, some of the system users believed that the reporting procedure just provided more information for superiors to handle and control events. Local managers might still have to solve the problem by themselves and cannot get any support from their superiors. There seems to be some gaps between users in local schools and managers at the governmental level about the functions of the system, as the excerpt below suggests,

> '…I think that it may have if I am a superior at the top. For those below,

> normally we report through it, actually we have to report again by telephone. So for us, it just means added work. Superiors at the top think that paper information may help them manage, there are some gaps in the middle…….'F4

> '…It's just a reporting system; and less of a management function for schools. Why I think that there is no management function is because the higher authorities will not tell you how to deal with events… we only have to report an event….schools still have to deal with the event by themselves….' D3

Another common phenomenon in bureaucratic organizations is highlighted by the response below. Establishing the campus security centre and reporting of events are duties for some staff at school. They are not likely to argue about this because of their status, and their training has taught them to accomplish their responsibilities and duties without question.

> '…we processed it when we got the plan from the higher authorities according to the characteristics of the school. We communicated with the president and other heads of departments at school; then established the campus security centre at school. Mainly we are military personnel, we do what we have been told by our superiors, we execute it at the basic level..…' C2

So, functionality is in part related to the disciplining of a hierarchical culture, as the following comments demonstrate:

> '…I dealt with events according to the obligations given by the school, whether you are happy or not. I will report the event …' C5

> '…my personal opinion is that I should report it according to the regulations. Describing the truth and do not omit anything. I think that this is the best way…' D5

In general, system managers and system users almost inevitably have different viewpoints and attitudes towards the system's functions. On the one hand, dealing with events may be the first priority for schools because the system user may also be a

handler at the school. On the other hand, the priority of handling of event information is probably the main concern at the governmental level, because managers not only have to find possible sources of support but must also try to avoid secondary harm to the organisation brought about by the interrogations of legislators or journalists. So, managers serving at different levels of organisation have their own concerns and viewpoints with the use of the system and dealing with events. Consequently, I will now try to explore what kinds of organisational problems may happen and influence the operating and use of the system.

6.3.3 The potential problems of managing events within a hierarchical organisation

The management system was originally developed by the Ministry of Education. After it had demonstrated its ability to gather information and mobilize manpower, management was transferred to the Department of Military Training Education, which developed and managed the CSRC. One of the answers below highlights some phenomena that cannot be fully divulged but which are probably a feature of general management in most hierarchical organisations.

> 'the whole task failed at the XXX department [which was the management unit for collecting campus events originally]; in any government organisation, whether they are educational administrative departments or others, they will not admit failure because you may be punished if you admit failure; including failing on investment or a programme……they published the annual report on the campus report analysis…but looking at the report now, it was just for reference, it's kind of perfunctory…there are some problems with it..' S1 (A1)

It seems that the management task had been organised and managed by others in different departments for a period of time. The management of campus events is a routine task whereby managers collect information then publish an annual report. In the past, although the report was completed, it was of little use because the analysis data was limited, the work of a bureaucratic management culture. This demonstrates that the impact of risk management partly depends on how much importance managers accord it; they may pay attention to it or just as easily neglect it. Therefore, attitudes and behaviour of managers is an important part of risk management, which not only influences the success of programs but also has an impact on the utility of the system.

This view is apparent in the following response:

> '…when the system had been operating for two years there was a review; I think that the change of managers was a big problem. The changing of operating staff was too sudden; it was not done gradually, all managers were changed. After the change and depending on their level of concern about the task,…the attention level of directors….after a period of time the occasion [using the system information to prevent particular events] has gone; it is hard to understand…..S1(A1)

Managers are like a 'juncture' it seems in the sense that they can not only help to improve the system's utility but can also reduce its functioning as well. If the director of a department pays attention to the task of management, the problems inherent in the system may not become apparent, at least not immediately. Obviously, if system managers understand the concepts and functions of the system, they may make full use the system to manage risk. However, when managers are replaced, the new managers might not yet know how to operate the system properly, which means the utility of the system will probably be reduced. Such problems are not likely to happen at the highest levels of the CSRS but may appear at lower levels, as is evident in the following discussion of organisational culture:

> '…the campus is also a hierarchical organisation, from the president to heads of departments. Particularly, in a private school, he [the school president] thinks that I understood everything; I am the highest, dealing with events according to my role. He ignored the fact that risk management is team work, that he's just one of the team… ' S1 (A1)

Indeed, the risk management task is a kind of team work, extremely difficult to perform using personal power or knowledge alone. The response above indicates that there are directors who sometimes ignore the team-working dimensions of risk management. Whole problems can normally only be resolved by the interaction of team workers and require more than just the personal determination of a school president. It seems that some directors have a tendency to overuse their power as part of a hierarchical organization. Such *ultra vires* behaviour may influence the dealing with and handling of risk, and have an impact on the system's functions.

The discussion has so far concentrated on problems of operating the system that are likely to be related to management behaviour and leadership within schools. But there are also some potential problems at the cross-management level, between higher and lower levels of the organizational framework, for example,

> '…generally, a report published in government units just shows the figures. We think that such analysis with big trends only presents trends. It is actually very hard to find out about concrete policy making or strategy from a government report … In the last two or three years, we have modified some processes … counselling schools with the highest event rate … the effect is better ... just figures for schools or lower management level … there is no pain for them immediately … ' S2

The excerpt above not only adds to our understanding of why the overall responsibility for managing events was passed to a different department. It also highlights the possibility that, if the handling of events simply means providing regular and routine information for managers, then the preventative rates of the system may not be as high as expected because, despite the observation made earlier by one respondent, it is unlikely that statistics alone show how to prevent or deal with events. It seems that most managers serving at lower management levels simply follow the regulations or procedures if there are no particular policies or strategies in place for dealing with an event. Managers in different positions may have their own concerns; and most risk managers seem to deal with events through their existing models of an event with the help of the technical system. The following response illustrates this:

> ' it's just for reporting, the school still has to deal with events … except for an important event, superiors will not assign people to help, the system is just for reporting events, it cannot provide any help and just perplexes me, it's less functional. We carry on preventing events as we have always done … this will not be enhanced simply when we got notices from superiors … we still follow our regular practice to deal with things in school … ' D4

As the quote suggests, some managers believe that even when they report an event through the system, only minimal support will provided by higher management. They even argue that reporting an event may bring more trouble than it is worth or overload

them with extra problems in addition to the event itself. It seems that they tend to stick with existing models for dealing with risks, rather than changing the regulations despite the frequent suggestions of superiors. The response below also helps to explain managers' concerns in this respect:

> '…I think that the system did not perform very well. [I]t is of limited of support from superior….' D1

> '… For schools it may be useful occasionally but its general function not so much; many teachers do not even know we have the thing [reporting system]. ' F8

The risk management task is just one of the responsibilities of school staff, although there are probably many administrative staff and teachers who do not properly understand the system or even know about its existence. This is possibly why some managers expressed negative attitudes towards the use of the system to manage events. These operators have had to respond to events without the support of either higher management or their colleagues at school. Moreover, the answers below include some negative opinions and attitudes that indicate there is another potential problem with the system.

> '…the management function is not good enough … the function could be promoted … It's just a reporting system, only there to provide information for our bosses … I cannot sense the prevention function…. ' B2

> '…the reporting is passive which means the action of reporting takes place after the events have happened … so from a management perspective, it does not help the task of prevention management actually … It tends to be more about reducing and recovering the damage … It's a passive operation' B4

From this perspective, the reporting process is a passive response to events that managers cannot control or prevent, because it does not occur until after an event has happened. They feel that the system functions more as a way of reducing and recovering damage than preventing events, partly because managers are located in a passive position. It seems that there are some possible gaps and even tensions between the system managers and operators, and some operators even argued that using the system

to report events can cause additional complications. Even so, they will still tend to follow the rules about reporting incidents at school. Consequently it may be worth exploring how system managers built the reporting culture after establishing the management system, and what system operators' experiences with and opinions of this organisational culture are.

6.3.4 Building a risk management reporting culture

In general, it is probably reasonable to assume that most staff will follow a regulation that has been issued from above, when working in a hierarchical organisational culture. There would appear to be no room for deviating from or applying personal judgement to the administrative regulations. Such a viewpoint is considered in the answer below:

> '… in this culture, they have to report events if the regulations ask them to. No one will refuse to do this on campus … schools may also not report in the normal manner … report or not report, you can control by yourself …' S1 (A1)

As the decision to report is made by individual users of the system, they can choose whether to report an event or not. If a case is not publicised by the media, no one will ever know the event happened, apart from the school itself, not even the CSRC. Likewise it is impossible for the Ministry of Education Department to monitor everything that happens in each school around the country. The reason school managers report events seems to be because they believe that the system can help them prevent future events. Therefore, there may be some potential benefits after reporting through the system. For example,

> '…I do not think so; the Ministry of Education Department cannot monitor what happened at school … it just provides an early warning for schools …' C4

It might be argued that system designers should consider how to improve the reporting culture rather than just expect users will follow the regulations when operating the system designed by the CSRC. However, even if they do this, they will still have to contend with the unpredictable aspects of local culture, which may influence and affect the reporting of events. One of the possible concerns is highlighted in the following response:

> '…did users follow the reporting regulation to reflect the events with the three levels or did they withhold events which will cause some "Dark Figure"? …' S1 (A1)

The "Dark Figure", in related to some event withholds by school and managers did not report them to the CSRC through the system, referred to here are the potential invisible threats which may influence the management and prevention functions of the system because it may reduce the system's reliability. Apparently, it is likely to be an important issue for system designers to consider how to reduce and prevent it from happening at the local level. To avoid such phenomena, system managers may not only have to improve and modify the system's function but might also have to empathize with the behaviour and thinking of the users. The following excerpt considers this issue:

> '… When the system began operating, some schools avoided reporting events. They would withhold events and thought that it was unnecessary to let you know. Why I should tell you if you did not get the information of event? Because it is no help for me … there are some reasons. Firstly, it influences the reputation of school. Second, it may influence the rights of clients and parents. Third, what kinds of benefit you can give to me if I report the information to you …' S1 (A1)

From the discussion above, it seems that system managers find it difficult to influence the reporting process as it currently stands. Events may be happening at every school around the country but because the decision to report is up to system operators, system managers may never get to hear about them. System designers and managers may therefore have to introduce some functions or establish new regulations to construct a reporting culture that reflects their position within the system, as passive receivers of information. Alternatively, they can attempt to integrate or track events recorded by others organization or systems. For example:

> '…we use many ways … such as tracking insurance companies firstly … then put the information of the student's claim into the system … and send a governmental document to the Bureau of Education in the city … asking them to correct it … they will alert us the following year … ' S2

The excerpt above suggests that tracking events through other channels may help to

create a reporting culture which takes into consideration the tendencies of system operators from higher level to lower level management. Tracking insurance companies seems to be an alternative way of governing the event-happening ratio in schools. In addition, tracking student insurance claims was an example of pro-active management, which not only improved a reporting culture but also gave a warning to the local authorities. To establish an efficient reporting culture, it would seem that the senior managers need to provide their subordinates with practical assistance rather than simply punishing them. This would not only improve the reporting culture but also the reporting rate in the future. Moreover, there are online network features to the system that provide a degree of automatic reporting of events:

> 'Because this is a network system, staff will check the reports from different levels of schools in the CSRS every day. It has two functions. Firstly, checking the reporting functions and procedure … if there is any mistake … we will give feedback immediately … another is that we must integrate important campus events and present them to ministers … if there are any mistakes in the report, we will send an official document to rectify them … this is a kind of inspection … M1

Inspection is a kind of monitoring function and can be used to control and improve the quality of the system overall. It enables system managers give feedback and guidance online, as well as check the information of events. There are two functions being performed here – the interchange of information and correcting mistakes immediately. These are not only an essential part of administration but also a legislative requirement according to the laws of country, for example,

> '…whether it is the "Gender Equality Education Law"… or the "Sexual Assault Prevention Ordinance" … depending on the regulation … these regulations ask that the report is made but that it does not reveal the names of clients.' S1 (A1)

Most of the administrative regulations of the CSRS mirror the laws of the country and an event cannot be dealt with in a way that goes against these laws. Therefore, the system also has a notification function, which is to make sure operators do not break the law when carrying out their duties. This is described below:

> '… because the law requires it … We will notify them how to do it through a window. So, if we make some modifications … we send notices to reporters to report [according to the procedures and regulations of law]…' S2

Significantly, most operators will want to avoid another incident happening when handling or dealing with an event with legal implications. Some of the opinions expressed in the interviews with school operators suggest that monitoring immediately also puts pressure on staff when dealing with and reporting such events. For example,

> '…that is a bigger problem if superiors get the information after the media …' A5

> '…the system lets educational staff know what events should be reported up a level, otherwise they may be punished … and it encourages alertness …'F3

The limitations of regulations or law may cause managers to realise the importance of being timely when dealing with events. Such pressures can be seen in the following answers:

> '…there is a mandatory requirement of the system … 15 minutes to report the event by telephone if it is "A" level and paper work in one hour; then, 12 hours for "B" level; after that, "C" level in one day … we will feel under pressure, actually…' C4

> '…I think that there is a punishment if we do not report events immediately, it may cause much inconvenience for the school. I may have to deal with many things at the same time…' D1

From the management point of view, on the one hand, when establishing a reporting culture they may have to consider not only some positive functions for encouraging and providing support to users; on the other hand, they may also have to introduce some negative regulations for avoiding punishment, even for behaviour against the law. Punishment though appears to be rare, suggested by the comment below:

> '…there was only one case which suffered punishment … they did not report a sexual assault case … according to the law … he got punished ... a

serious punishment…' S1 (A1)

Obviously, the establishment of a reporting culture has to prioritise the rule of law, then, the requirements of the organization and the support functions for system users. In this section, I have explored the occasion of the system's design, the basic concept of handling events, the potential problems of managing events and how to establish a reporting culture in a hierarchical organisation. Significantly, some gaps and similar concepts can be found between the system designers and operators through the discussion of the development of a technical management system for managing risk. In the following section I will focus on exploring users' opinions towards operating the system in risk society.

6.4 The operation of a technical management system in risk society

The previous section explored the historical background to how a technical system was developed, discussed its functions and the advantages and disadvantages of handling events within a hierarchical organisational framework. As we have seen, the design of a technical system not only has to consider the functions identified by the organisation as important but may also have to understand the requirements of managers and operators. As Hughes (1989: 52-53) points out, the development of a technological system is about solving problems or fulfilling goals. The focus should be on the social problem rather than developing a specific or unique software program for technical purposes (Williams & Edge 1996: 53-55). The discussion above examined participants' opinions towards the functions of the system but, in this section, the focus will shift to their experiences of operating the system in a risk society.

6.4.1 Using the system in organisations

The reasons for establishing the technical system in schools, which I explored in the previous chapter, essentially boil down to improving management's abilities to handle the natural or man-made events that occur in educational institutions. In order to establish a successful technical system, system builders have to consider various factors – including technology, economy and policy (Hughes 1983; Donald 1989: 196). At the same time, and indeed because of these social and economic costs, risks will be prioritised. For example:

'…you may not pay attention to some events, but they may be a concern

> for other institutions … such as an association concerned about leisure in primary schools … For us, if it is a "C" level case, then maybe we will not worry about it really… we have to deal with it according to our priority…' S2

Although the system was designed for controlling and handling events in schools, at the highest level of management, managers may hope to control what are seen as more significant unpredictable events rather than attend to general events that may just cause slight injury or inconvenience to students. Such a view may be found in this comment by the system manager:

> '…actually it can be distinguished as [risks of] many kinds, one can be dealt with by school themselves … like a slight injury by traffic car accident … they need to report it according to the regulation but this level of event can be solved by schools themselves …' M1

It seems that although the regulations of the system ask operators to report every event, system managers tend to ignore events which may be seen as routine cases that can be fixed by schools themselves. Even so, staff in schools reported a tension between both the dealing with and reporting of events at the same time:

> '…actually I think that dealing with an event is more important than reporting it … we will report the event if we really need your help … if not, then you control it instead. And we may feel rushed and confused about the point of dealing with the event …' D1

On the one hand, the system has improved the abilities of a hierarchical organization to manage risk because it helps the highest managers to handle events around the country immediately. On the other hand, the system may cause some inconvenience for local organizations because the process of reporting events demands staff resource and time, which probably could have been devoted to alleviating risk in the first place. It seems that the system not only provides a visible means for managing risks at the highest organizational level, it may also have an unacceptable influence that impacts the effectiveness of those dealing with events at the lowest organisational level. Indeed, for most operators, priority given to either reporting or dealing with events is likely to depend on their personal attitudes towards the use of the system more than its actual

apparent functionality.

This reference to handling 'real events' and doing so effectively at the local level reflects a basic concern of most managers, who will try to deal with events in as simple a way as possible and avoid more complicated side-effects of the event from reoccurring again.

> '…we must think for ourselves. We have to deal with events rather than complicating things when an event happens …' A4

Indeed, system managers implement regulations for operators to follow or use as a reference point but sometimes users will still deal with events according to their judgment or thinking, users are not in Woolgar's (1991) terms so easily 'configured'. Consequently, I will now explore some aspects of operating of the system that contrast with the original design. Respondents felt that some operational factors should be considered before a technical system is designed for users. For example:

> '…we hoped that it would be easy to use from the screen without training when we designed it …' S1A1

It seems that both ease of operation and instant response are the two main factors which have to be considered regarding the operation of the system, because such factors may cut the operational training and management time it takes for managers to collect information at the top of organization when managing risks. Meanwhile, those using and operating the system may have slightly different expectations to system designers or managers. The operators not only provide information about the events but may also hope to receive some resources as a result, for example,

> '…we will expect that monitors and managers [of risks] at the top of the organization provide some resources to us [to deal with it] ...' C4

It seems that most operators not only give information but also want to be given support through the system, because they are likely to be more concerned about dealing with events than controlling them, in their roles at the bottom of the organizational hierarchy. When operating a system to manage risks, people may worry about dealing with the procedure if they know their actions will be monitored or under surveillance by other managers at the top management level. However, they will also be interested in the

responses of their superiors to their reports:

> '…we do not know if we can get resources from superiors … just complete the responsibility as a reporter … can this case be a reference case or matters for teaching … [but] there is not any follow-up information to understand it ...'D2

Obviously, in order to prevent or control some of the unpredictable factors or impacts of events, most operators will seek more information from the system, especially if they know the system has integrated data on many similar events already. There seems to be some differences in the expectations of system designers/managers and operators regarding the operation of the system. While some operators wanted more guidance from superiors at the top of the management framework, other comments related to simplifying the design of the system, developing a simpler process of operation, using, for example, tables and a selection pre-defined functions rather than typing in text:

> '…firstly, simplify it [the operation procedure] … reporting the continued information of event causes it to add a new case [the system may recognize the reporting of following information as new event]...' A2

> '…using tables or a selection function rather than language description ...' B3

> '…the user cannot add a new column if the system information is not enough for describing the events….' C4

Some operators seem to depend on those aspects of the system that may enable them to avoid making mistakes when operating it, especially if senior staff are away. This may involve various technical elements. For example:

> '…the system should provide some samples, a standard demonstration ...' C5

> '…the system should notice automatically if the operator makes mistakes…' D1

> '…you can only see the record of the school … if you could check events from other schools it may be more helpful …' F5

> '…integrating some information which shows a good sample from other schools … and creating a public discussion space would be useful…'F6

Yet at the same time, the technical limits of the system were also apparent; when a system has operated for a period of time the system itself and the equipment which runs the system may not support its effective functioning, as it was originally conceived. As one local operator said:

> '…the computer equipment at a school may not all be new … it may be very slow … the information may stick … or off-line … the equipment is too old mostly ...'A5

Obviously, by using the system to manage events system managers not only expect to improve a regimes' ability to control events but also operators' ability to anticipate events. Operators are empowered with the task of preventing events. However, a basic presupposition is that the equipment channelling the technology and its functions can be upgraded and controlled with each new threat identified by risk society. Consequently, I will now turn to how managers apply the mass of data to the prevention of events and how the staff used this information within the hierarchical organisation.

6.4.2 Perspectives on the use of data

As discussed above, the functioning of the system may be different depending on the perspectives and purposes of system managers or users. In this section, I will explore interviewees' views and concepts about the analysis of data within three operating levels, from the top to the bottom of the system management framing. Obviously, both application and sharing of data were considered when developing the system according to the responses I had from the system designer. In order to apply the system data properly managers may have to understand what the priority for the organization is, and how to achieve the best effect from it. For instance:

> '…we must find out which problems we are more concerned with than others from the system, this may be understood through the report. Some problems may come from the intuitions of media or citizens … such as, if lots of people are taking drugs, I do not need the report information to support my viewpoint … the superiors will support the policy change without the support from figures ... some events may need guidance from

> the figures … For example, when is the peak month or season of the year for traffic accidents … or more events from death or drowning … or suicide … we can provide preventative information … to remind each unit and institution … how much can achieved by early warning … it is worth referencing' S1 (A1)

It is true that some events may be prevented by the analysis of recorded data, if they contain information on frequency characteristics or geographic location, or the personal behaviour of a particular group of the population, who can then be targeted. Whereas, other events which cause concern and worry in the media or among the public may be hard to understand via data themselves, especially if the events related to some contested risks such as drug abuse or antisocial behaviour such as car racing. Significantly, the analysis of the data has improved some aspects of event prevention and policy making; however, sometimes policy making for managing events may be caused by a single event and without the data to support it. There is another benefit of sharing information and giving authority for analysis of data in a technical system. For example, the system design not only includes a data analysis function for senior managers but also provided one for operators, a point noted in the answer below:

> '…the database provides an online data saving function actually … each unit can search for historical information on campus events at their school, we also hope they can analyze events according to the reporting after the events … they may modify or draw some policies on campus security … according to the trends of a school … ' S2

Despite the fact that the analysis of data provides some preventative function, to help prevent similar events and enable policy makers to reduce deviant behaviour amongst students, two drawbacks may be found in the technical management system according to the responses of system managers. Firstly, it is difficult to examine the effectiveness of sharing information through the system because the system is just designed for the reporting of events not for tracking the effectiveness of management itself. Secondly, the turnover of staff may bring in new managers not familiar or versed in the management task and system function, as can be seen below,

> '…regarding how they make some strategies according to the reports or figures, actually they will not respond to us. This part is hard to

understand… ' M1

'…I just received the work for half a year. I heard from senior staff that there is an annual report … it seems to focus on … I am not sure that it is focused on accidents … I have not dealt with this part in this half year now…' M2

Indeed, both preventing events and making policies may be improved by the analysis of data from a technical system; however, sharing information and inheriting experience may be hard to design into the system's functions because such factors may be difficult to standardise depending on how operators use the information and what their focal point is. Consequently, it may be worth examining whether the system operators use and analyse the data after they report events through the system.

According to the responses, it seems that the tasks of analysing data have been done by most of the middle management level at cities or counties. They tended to see various possible reasons and factors which caused and created the events within their administrative management boundaries. As can be seen, they not only analyse the events by month and year but also tried to distinguish the possible reasons. They are likely to believe that some events did not happen by coincidence and they can be integrated into some frequency characteristics; even the analysis of data may help them to find out some solutions for reducing the probability of events occurring. Such ideas are contained in the following answers:

'…we focused on how many cases there were from January to December every year in the county. Then we analyzed the categories of events. Why does it happen in these few months? ... we can find the frequency of events and the function for dealing with them from reporting of campus events.' A3

'For example, how does the traffic accident happen? How does the suicide happen? How does campus violence and bullying happen? Then provide the reference for counselling.' A4

However, when examining the analysis of data with local operators, they expressed both positive and negative opinions about this task. As can be seen, some school operators tried to understand the characteristics of events with the help of historical data. It may

have been a requirement of their current work to look into the practicalities of events, for example, the business of traffic security. Others focused on examining the broader statistical pattern of events at their schools. For example:

> ‘Hope to understand the characteristic of school, did the media report it, such as fights … relationships between male and female or traffic accidents, which probably show what kind of events happen at this school …’ C1

> ‘…we did the statistics by month and season according to the statistical information from superiors, or statistics by year in relation to all of the events that happened at school …’ D4

Despite some operators analyzing the data for improving the management of events or supporting particular work at school, most of the system users did not seem to have considered analyzing the data. As can be seen, most operators expected to acquire more information from senior staff in the organization rather than analyzing the data by themselves. They tended to believe that they did not have the qualifications or abilities to analyze the data. Although some operators may be curious about the system’s functions, they just surf the system and check some historical data. This is evidenced in the answer below:

> ‘…we are not at the top of the organisation … we expect surveillance and management from the top of organisation, and them to release some figures for us to reference …’ C4

> ‘…we did not analyse … we may not have the ability to analyze data at our school’ D2; D3

> ‘…the quality is too low at school. We do not have this function’ C3

> ‘As I know, we did not … we will log into the system to understand what events have happened at school … just curious …’ F5

It seems there is a big disparity between the system designers and operators, contrasting the manager at the top of management framing with those at lower end, when it comes to discussing the matter of data analysis. On the one hand, the system designers built in a utility function for operators to integrate and analyze data through the system. This

function seems to be applied and used only at the sub-organisational management level. On the other hand, most of the operators expected information from the system, as opposed to functions. They tended to believe that the system should provide information automatically, and were reluctant to analyze the data because they felt they did not have the necessary knowledge or skills to do so. It seems that most of the operators did not know that the system already has a basic statistics function. Consequently, in the next section I will explore whether managers and operators actually use the analysis of information for managing events.

As discussed in Chapter Four, an annual report has to be published by the CSRC each year and then posted on the web-pages of the system. As can be seen, the task of producing an annual report has been undertaken by the CSRC each year; however, the system managers seem just to post it onto the webpage and send it to the other internal departments in the Ministry of Education Department. This is apparent from the answer below:

> '…every year the Ministry of Education Department will integrate and analyze the data … the report was published when XXX was charged with the responsibility … we followed their way … analyzing the data and composing a report every year ...' S2

> '…each year we will ask for these figures and the database … we commissioned some professional scholars to analyze it … the results we will post on the web-page for academic areas … students or parents who are interested in it or for reference … we will send it to other internal departments … but I have not seen any department using the information for policy making …' M1

In Chapter Four, the discussion of the database presented some significant trends, which provided many clues about how to prevent certain events; however, two problems are apparent from the excerpt above. To begin with, it may be reasonably inferred that most of the internal departments likely are not concerned or will not consider a report from other departments for policy making, particularly if the report was not produced by them. Therefore, the analysis of the system database is likely to have become a kind of routine procedure or task, published each year and posted on the web-page in a hierarchical organization. The second problem is whether operators receive or check

those annual reports from the web-page of the system through the internet. Such debates may also be a concern for system managers, for example:

> '…it is hard to understand. When people demand data through the network, they will not give feedback and let us know who asked the information … if we do not know which units asked for the information, we may not understand how to follow-up effectively …' M1

Indeed, on the one hand, the system has made it more convenient for organizations to manage events, which in turn makes events more controllable. On the other hand, it has also caused uncertainty for organisations, which means the report information is less useful. Such phenomena significantly could be found within some operators' answers. As can be seen, unless operators have particular requirements due to their work or responsibilities, in which case they will check the reports online, most claim to have got the annual reports from other resources, such as meetings, workshops, training or official documents, for example:

> '…I have looked but not every year. I download data from the CSRC. I am not sure that they posted it on the web-page for school to download …' B4

> '…I have looked at a report in relation to traffic accidents which is commissioned by the analysis from University …the other part I did not' B5

> '…the information was sent by official document to us … it is a table with ratios ... we read it if they sent to us … passively …' D1; D5

> '…related reports, such as internal newspapers or the information from the meeting of head of departments, then including electric board from network etc…' V3

Despite the annual reports being posted on the web-page of the system, significantly, the action of collecting information was not taken for most of the school staff. It seems that they got information from other channels, passively, even though they can easily and automatically download it from the system. Otherwise, some staff seem not to have had any information, neither from the system nor from other resources.

> '…I did not see it, because I just arrived so I only know about the information of school …' F3; B1; D3; F6

> '…it can probably be seen at a higher level … I do not know if I can see it or not … I heard about it in a workshop … I felt that the information was more and more prospective … ' C5; F4; F8

It seems that the system designers built in an automatic function for sharing information, a function for feeding back experience to operators. However, as can be seen, some operators argue that the system's function is just to report incidents to the highest level in the event of an emergency case and that the procedure for reporting of events may cause overload to staff. Some operators even think that they cannot get any information or support from the system. The discussion above highlights a general phenomenon, which is that users in a hierarchical organisation will normally not retrieve information from system actively but wait for information from the system passively. It seems that the annual reports were probably not very effective for preventing events because events still happened at school and caused harm to students, which is shown by the statistical results of Chapter Four. Therefore, it is worth considering here whether there are any problems with the report, or if any suggestions about the report were made by managers or operators.

In Chapter Four, I reviewed the mass of event information recorded by the system; such data is likely to indicate that particular events happen at individual times, months or seasons according to the trends or figures of statistical results. However, although such statistical information opens up the possibility for even prediction, it does not provide a suggestion function for dealing with or preventing events. This problem is evident within the excerpt below from one of the system designers':

> '…Nowadays, the analysis is quantitative, focused on the number of events and the number of people injured or dead; we do not focus on how to deal with it. The analysis of dealing with events could direct the preparations of schools, such as, some general deviant behaviour happens on campus, the reasons why it happened … it should provide a correlation, a figure which provides references for every unit to advance it. This thing [analysis information] has not been analyzed in depth …S1 (A1)

Many trends and figures can be found within the annual reports. This quantitative data production would appear to achieve one of the routine goals of a hierarchical organization; however, it does not significantly improve prevention capabilities or reduce events at the level of practice. It seems that users at the operating level prefer a substantive example for reference more than figures and trends, because some similar case information not only gives direct guidance for imitating or learning but may also help to actually prevent events. For example:

> '…the Ministry of Education Department published a report related to campus security events but the contents did not analyze the details, such as, what kind of place it may happen, what kind of events, which it could easily provide for staff to enhance it … actually we cannot deny it totally … such as it helps a lot on the renting of school buses for school … there was a case with a school bus accident on a crossing which caused the death of students … after the review of this case, they provided a sample in relation to contracts for renting buses … it provided basic information for staff … using it they will feel more empowered …D2

It may be reasonably inferred that, in order to prevent some possible events, a clear and definite procedure or example may be more useful than the analysis figures or trends for operators serving at the bottom of organisations. The discussion above may explain some of the results explored in the previous chapter, where operators presented both positive and negative opinions towards the system's function. Some operators seem to use data passively. Some try to discern patterns or models from the historical information, to improve their prevention abilities regarding the reduction of events for organisations. Consequently, it is interesting to explore how operators extend and use the system's function with the help of historical information, to reduce events at school.

6.4.3 Ways in which the organisation might use the information produced by the system

As I argued above, in order to improve the reporting rate and motivate a reporting culture, there are some strategies that system designers/managers can apply to convince operators to use a system. As well as establishing regulations and invoking the law to discipline operators, it seems that designers/managers also considered and provided some inducements and benefits to persuade operators and administrative staff to

embrace their roles. Such methods probably not only improved the controlling and handling of events at the management centre but also empowered many staff at the educational institutions to deal with and resolve events. Evidence for this can be seen in the answer below:

> 'We provided support by focusing on schools. The benefits you get when you report events to us … I give a budget and manpower when you report an event … help you to evaluate without your money … help you evaluate the environment, including inside and outside of campus, in relation to the previous case … help you to find out and evaluate the problem … this function has reduced some cases in schools…'S1 (A1)

However, some operators argued that even if schools tried to prevent events there are still many potential sources of harm, particularly those emanating from students themselves. They tended to believe that nowadays in a pluralistic society, events may be influenced by familial education or social behaviour and these factors cannot be prevented or controlled by staff at school. The following account makes this explicit:

> '…there are multiple categories and reasons causing events now. This may come from different levels. The concepts of familial education; even if schools undertook some prevention work, students may not follow the recommendations of staff. Some conditions may still be there.' M2

Though there were some negative attitudes towards the prevention of events simply through recording information, it may be worth exploring whether some operators actually use the system information to prevent possible impacts on their school. According to the response from an interviewee presenting positive opinions, it may be concluded that there are three main methods for using the system information to prevent events. Firstly, staff may provide both positive and negative knowledge to students, educating them at the same time. Significantly, some operators seem to believe that schools should not only give accurate information to students but also foster in them a basic ability to judge events such as, the problem of drug abuse or teenage pregnancy. This in turn pre-establishes a psychological propensity to avoid events via influences such as pressure from peer groups. Staff tended to believe that in order to empower students' ability to avoid drug abuse, schools should not only provide positive knowledge to educate students but also highlight the negative aspects or how the

psychological construction of education may help them leave problems behind. Such concepts and opinions can be seen in the following excerpt:

> 'Nowadays, education tends to educate students about many positive but fewer negative concepts of events … We should provide negative information to them about things like drug abuse and gender relationships. In the past, people ignored such issues, even skipped the courses … which made students more curious … tried it by mistake … education with both positive and negative sides will help children make a reasoned judgment, and it would be more practical …' A2

> '…You can pre-establish a psychological construction [some possible risks in particular weather or season] if you know a condition of this month. You will not influence students' emotions … A2

Secondly, using and applying particular figures, trends and cases of events may empower both staff and raise student's awareness of and abilities to deal with or avoid events. In order to improve the multiple functions of system information, such data could be classified into five categories – including gender, figures (the number of event), characteristics (particular type of event), trends (the increase or reduce of event in a period of time), and the frequencies of events (frequency with weather, time or particular season). Initially, although each school may have their own unique problems with students, some operators seem to believe that most events can be separated by the factor of gender. They supposed that events may be prevented and alleviated by distinguishing the gender factor, if only they could get information about what kind of events are caused primarily by male or female students. This can be seen below:

> '…it could easily be deduced what kind of events may happen to teenagers if we had the figures, but every school may be different, also it has to be separated by male and female, they will have different problems …F1

As well as through the factor of gender, some events may be discovered by an increase of particular cases. For example, some events may be created by the socialization or drug abuse of students, which probably influences both their psychological and physical health but such events may not show a significant increase because such cases probable just occupied a small number of events if contrasted to the total number of events.

However, they may be demonstrated by some statistical results if divided from the overall events rate, for example:

> '…such as the case of drug abuse, we provided the figures to schools … actually it has spread but no one can prove it ... then the cases rose from 5 to 33 in 2007, now it is 41. There was eightfold increase in two years. This figure shows that there was more and more drug abuse at school …' B5

Besides, some events may be reduced by classification of event's characteristics, especially if such events are caused by similar types/peculiarities of students or happened at a particular place or time. Therefore, some staff seem to believe that the abilities of junior or new staff to deal with events may improve by studying such recorded data and information. This is evident in the opinion below,

> '…it can focus on a particular place, time or the tendency or characteristics of a particular group of students … it can help new staff to know how to deal with events … but it depends on the cases, for example, with the deviant behaviour of students or fights, I believe it can … if an event has a potential problem … like a student suicide is a kind of Latent [potential] event, so it may not … F2

Moreover, the analysis of data is likely to point up events associated with a particular season and such information is kind of a signal, providing an early warning for managers and staff to take measures to prevent it. Indeed, some events may be influenced by natural factors, such events may increase with the change of weather conditions, for example, food poisoning and drowning may happen in summer more than winter. These trends may be presented through statistical results to remind staff:

> '… I remember that the cases of drowning and car accidents may have a higher frequency around summer every year, as I know from analysis of the system. We will enhance it when disseminating to students … F8; V3

Otherwise, the data not only provide some trends for preventing events but may also demonstrate the high frequency of events over a yearly period, which may enable managers to organize a long-term plan for managing events more effectively. Such plans may not only improve managers' ability to prevent events but may also provide some useful information for all staff to coordinate the management tasks with other

colleagues at their organizations. For example:

> '…we can know that the more conflict events may happen at the start of a semester between teacher and student, it is stable in the middle of the semester, and gradually increases at the end of the semester … the characteristics may be different at each school …' A2; F7

Finally, the data could help to establish the characteristics of events in relation to their causes and sharing this with students and staff. Significantly, preventing events before they happen may be one of the best ways of managing them. According to the responses, it seems that preventing events may be done by making staff and students more aware of the environmental characteristics and potential problems they may meet. Significantly, some managers appear to be not only using the data to prevent events but also sharing the information with their colleagues. For example, they may provide the analysis of events to staff or colleagues at school workshops or conferences. Such information sharing may improve prevention abilities for all staff but also provides some information and experiences for new staff to understand the characteristics of schools, which may help them to deal with and prevent events more easily. For example:

> '…prevention early… I hope I can understand what types of events will happen … is violence, drugs or accidents at my school through the system … avoid events before they happen … controlled and handled the characteristics of the school …' C5

> '…I think that man [staff and colleagues] is the first thing for risk management, the most important is a direct reflection … the turnover of staff is very high at school … I always communicates with new teachers … I will provide information to them … what is the most common event at school, at the city or country level for them to reference …' C3

> '… I am the head of department. If I get the analysis of information it can remind teachers to pay attention to it. I can use it at the tutor's meeting, discipline committee and school affairs meeting … the president of the school will be concerned about it … you always provide some information.

> The administrative staff does not know the point of the work if they do not get information …' C2

The responses above highlight the fact that staff attitudes play an important role in managing events, particularly those of new staff and the president of the school. It may be reasonably inferred that if new staff can understand the characteristics of an organization early on, they may provide useful manpower with which to deal with an event; while, if they do not understand the problems of the organisation, they may make new problems when dealing with the original problems. Likewise, if the prevention function is taken seriously by the president of a school such modes may be easily executed. Some managers are more focused on the task of sharing of information with staff; some target students and tend to use symbolism to attract their attention, such as the name of the school or a particular event that happened at the school in the past. These aspects are discussed in the answers below:

> '…such as if more traffic accidents happened this year we will exercise some prevention strategies and devise some response strategies …' D1

> '…students may listen to it if the historical information uses the name of our school … it can provide an alert function ...' F3

In addition, information relating to the characteristics of schools may improve the prevention of events, the factor of location being a likely influence over events and causing differences between rural and urban areas. It may be logically deduced that events can be influenced by the patterns and activities of society because such phenomena may be the primary or root causes of events at school as well. Therefore, in order to reduce events managers may have to understand the environmental characteristics of the area around the school. This is evident from the statistical results presented in Chapter Four but can also be found in one of the manager's answers:

> '…I think that there is a limitation on areas … such as the difference between rural and urban. Drugs may be a problem at city schools but will not threaten our school in the county [rural area] ...' V2

The discussion above suggests that the analysis information has some significant managing and prevention functions for both staff and schools. As can be seen, managers may develop a unique method to adapt their organization and to use the analysis

information from the system, although some managers are sceptical about its usefulness for schools. Broadly speaking, interviewees with more responsibilities are likely to have a more positive attitude than those with fewer responsibilities towards using the analysis information to prevent events. Obviously, using the system has improved the governmental organisation's abilities to handle and manage most of the events happening on campus. Consequently, it may be worth exploring whether the management level of the system makes policies based on the analysis of events, and how they use the reporting of events by governmental regimes. According to the responses, two types of event seem to be of most concern to the CSRC: frequent events and those events which, regardless of frequency, cause serious damage, according to the opinions of one system manager; and those events that attract the attention of the media and newspapers in particular. System managers not only have to deal with and handle events but may also try to avoid secondary impact or harm from the general public, media or societal reactions to an event. Such phenomena are highlighted by the following answer:

> '…the minister participates in a public awareness meeting every day, it means that he will hold a conference if some events related to campus security are in the newspapers ...he will consider the event seriously… actually, we are concerned about different types of campus events. Firstly, if the quantity is large … Secondly, if it causes a serious level of damage regardless of the amount …' M1

Indeed, one of the most important factors to consider when managing risk may be to prevent secondary harm from occurring; this may explain why the minister of the educational department seems to be more concerned about public sentiment than dealing with events. Furthermore, there are huge numbers of events recorded in the system over ten years and such data not only provides information on experiences and trends, which can be used for preventing events, but can also be used to make policy at government level. However, it seems that policy is made not just according to the analysis of events but may be the result of a single case, as the answer below illustrates:

> '…as far as I know the Ministry of Education has not made any particular policy according to the data analysis … but it may be not the real situation actually … take an example, a case where two students renting a house

> off-campus caused a fire because they were using electrical equipment improperly, and it caused their deaths … of course the story was reported by the media as big news … the Ministry of Education mobilized many people and was even rectified by the Control Tuan[which is a government department response for investigation the possible mistake of official department]. Therefore, a lot of strategies and functions were produced … to resolve the problem … we strengthened the work of visiting students who lived outside of campus and improved the environment …' M1

It seems that a death may cause concern for both government and society but it would not influence the making of policy. Indeed, policy making must consider a more broad level of factors, not just students, staff or schools but also the influence of society. The following excerpt also throws light on policy making in government institutions,

> '…to become policy it must be causing considerable harm, having a serious influence on or causing great concern for society … for example, I remember that the Ministry of Traffic or Police Politics Unit asked about reducing the age limit of the driving licence from 18 to 16 … this is an important policy… we disagreed with it, of course we considered the security factor … we were worried that the injury ratio by traffic accident events would rise if we changed it to 16 …' M1

The case above shows a shared interest and task which crossed two departments at government level, where policy makers are not just concerned with an increase in the ratio of events but also evaluate the possible impact on society and the public. Some policies and strategies seem to improve the prevention of events significantly and such policies are likely to be focused on education about particular events such as drowning, traffic accidents and suicide or self-harming. Some events may be prevented by education or propaganda but it may not work for every event. Although the analysis of results, by highlighting some figures and trends, performs a warning function for students and managers they do not reveal the real reasons behind events. This problem can be seen in the excerpt from one of the system designers below:

> '…policy making, for example, has helped significantly in three areas of education: drowning prevention, traffic security propaganda and suicide or self-harming prevention but it was not thorough enough … it did not

> explore the reasons for events such as drug abuse amongst students, you analyse a number of student drug abusers, why they are using it, and how to restrain it finally… ' S1 (A1)

Indeed, the ways in which the analysis of information was used depended on managers' attitudes towards its functions. It is difficult to distinguish all the factors influencing events, especially when handling and managing a mass of information. Consequently, there is probably a need for an analysis which not only highlights the underlying trends and statistics but also provides plausible strategies for dealing with events. However, producing this kind of information or devising strategies from the analysis information is not straightforward, as it can be seen from the answer below:

> 'Generally, a report just shows figures at most public institutions, a broad trends analysis just presenting some trends. If you really want to analyse whether it can provide specific strategy or policy solutions, actually you cannot see them …' S2

Significantly, recording a massive amount of events and analysing the events information provided many possible factors and trends for staff and managers to prevent events at the educational regimes. However, these huge numbers may cause others problem because it is impossible to analyse the reasons behind every event. This section explored the interviewees' opinions towards the use and operation of the system, as well as their perceptions of analysis reporting. Some staff seems to be using the system information properly, because they believe that events ratios have significantly decreased at their schools as a result of the system. Some argued that the system is not only unhelpful but also increases the number of problems they have to dealing with when faced with an event. Such phenomena may explain why, even though an annual report has been published by the CSRC every year, the events ratio is still increasing and has not been reduced as managers expected. The discussion above shows that how people use the system may be influenced by their attitudes and responsibilities; managers are not only focused on dealing with or handling events but also may attempt to prevent potential threats coming from the extending of events at the highest management level. Following on from this point, in the next section I will explore the development and modification of the system in relation to the factor of cultural context, considering the potential problems that may exist in local organisational cultures which

may influence the functioning and operating of the system.

6.5 The modification of a technical management system within a cultural context

The system has been modified a few times, with some of the main categories being expanded and many sub-categories added, in an attempt to improve the system and meet new challenges. When attempting to make a technical system more useful or effective managers may have to consider how well it can be adapted to the multiple characteristics of an organisation at different times or in different places (Hughes 1989: 67). In order to explore the process of modifying the system and the phenomena that potentially exist in local organisation cultures, four main issues are considered in this section: firstly, the reasons for modifying the system, which may show that managers changed the system's functions in line with the increase of events and social phenomena. Secondly, the discussion focuses on some potential problems and benefits of the system, exploring operators' subjective viewpoints of using the system for themselves and their organisations. Third, some debates uncovered in Chapter Five related to the withholding of events and colleague's hostile behaviour, are considered. Finally, there are some concerns in relation to the surveillance function of the system, privacy issues and the new risks stemming from the technical system itself.

6.5.1 The modification of the system

The fact that the events classification in the CSRS has changed a few times can be seen as evidence that technological systems do not always autonomously acquire the momentum needed to achieve the goals anticipated (ibid: 76). In practice, the consolidation of a system's functions relies on its operators using these functions appropriately and modifying them as necessary. Another factor is the development and improvement of technological performances. As one of the system designers pointed out, the system was developed by internal staff; therefore, the system safety may be dangerous or unstable because it is hard to evaluate all possible or potential impacts that may influence the system's utility function from individual point of view; moreover, the improvement of technical functions may also advance the modification of the system, such factors may explain why were the CSRS modified several times. Significantly, if a technical system does not provide 'user-friendly' functions it will probably be destined to undergo changes in configuration or have its function modified again and again, as the answer below suggests:

> '…this case was designed and developed by our internal staff; therefore, it did not cost any budget for outsourcing; so, the system safety is threatened … however, if there is any modification we will request opinions from local users … we will make some design changes … gradually, when the functions of web-pages became more popular and improved a lot in society, more human interfaces appeared; this showed that parts of the system were not user-friendly. This was a big question.' S1 (A1)

As well as problems surrounding the upgrading of technological functions, an increase in certain kinds of social activities can also lead to the modification of a system. New types of events are almost inevitably created by an increase in these kinds of social activities or the dissemination of technology itself in a risk society; some of the resulting phenomena may confuse managers as to the causes of events, for example:

> '…the first main modification was after around one and a half years, when we modified the event categories. The modification of event types was because we found that it was hard to determine which was the main or sub-event when users used it. This may cause confusion on the receiving end if the determination is not clear. Otherwise, of course the social events emerged in an endless stream, so we have to respond to the trends of modern society … actually it is a complex question to modify it ...' S2

The issue of what kinds of events warrant modifications to the system is a controversial one because, as it was shown in the previous chapter, managers' interpretations of events sometimes differ according to their responsibilities and positions at the organisations they work for. Therefore, diversifying the classification scheme may be difficult from a managers' personal viewpoint. Consequently, an alternative way forward may be to examine attitudes in society or outside of organizations, as the answer below suggests:

> 'Talking about the event of suicide or bus accident on student trips, for example,… for us, if this kind of events becomes an issue for society, we will make the appropriate adjustments.' S2

The system's categories may be changed with the increase of events or in line with the

concerns of society; however, it may be interesting to explore whether the *level* of events (in terms of perceived seriousness) also changes. We already know that the minister of the Ministry of Education Department will participate in a public sentiment meeting every day and that public opinion will influence the operating of a technical system in a hierarchical organisation; such impacts probably also created a gap between the viewpoints of management and system designers. For example, a system designer highlights that if a particular event increased significantly, such as suicide or drug use for example, it may be factored into the management or monitoring of the system, even if the level of the event does not change:

> 'the level will not change; we will consider, such as with the case of drugs we will pay attention … for example, if suicide and self-harming increase over a period of time, is it caused by imitation of the media … this will be taken into consideration …' S1(A1)

However, this interpretation is challenged by one of the system managers, whose answer suggests that if an event is reported by the media – print print or electronic – the reporting procedure will upgrade the event to "A" level. Obviously, the reporting of the media likely influenced the previous regulation of the system; it seems that in order to prevent secondary harm from the media, the system managers have to change the original concept of the system's design, which was to keep a stable operating procedure, to modifying the regulations as needed:

> '…we introduced a regulation that considers an event "A" level if it is reported by media … we think that media and public opinion will cause other influences … a simple event may create other influences after the reporting of media or debate amongst the general public … so we should face an event with caution and rigor; therefore, we changed the event level to "A" level …' M1

Along with the media and public opinion, which have caused changes to be made to the system's regulations, other factors also influence the operating of the system such as pressure from other associations outside of organisation. The following answers give an indication as to why the sub-category of suicide has been divided into three sub-categories because of the concerns of other governmental organisations, which in turn were under pressure from some non-profit organisations at society. As the result,

the classification of the event may have to be adjusted again.

> '…such as suicide, the original classification was just suicide but this is managed by XXX Department. They asked that suicide be re-classified, for example, if they committed suicide together with their parents this might not be the personal volition of a student. Particularly, nowadays society in Taiwan, some families have got problems, parents commit suicide with their children by taking sleeping tablets or eating charcoal … such cases should be classified more clearly as suicide with children, avoiding the horror implicit in the results of why a small child would commit suicide … Such data may be a concern for some social welfare associations or women and children's associations … also such figures may cause misunderstanding in society… M1

Obviously, both media and public sentiment played significant roles in the modification and adjustment of the system regulations because of the potential for additional or extended harm to the organisation. In order to avoid such threats to the system managers may have to change the original concept and regulation of a technical management system at the top of the managing framing. Consequently, it may be worth exploring some possible concerns within the opinions of operators at the bottom of the management framework.

6.5.2 The potential problems and benefits of system

As discussed in the previous chapter, operators presented both negative and positive attitudes towards using the system to manage events. Their opinions towards the system's functions may be classified according to the reasons they gave. Starting with the negative opinions, it seems that operators have four kinds of opinions towards using the system – increased workload, creates confusion, changing of attitudes with the increase of seniority and invading privacy. Firstly, some staff argued that the system has increased their workloads because they feel like everything has to be reported to the management centre, which makes the process of providing event information very time consuming:

> '…actually it can help risk management for everything, just some people may feel its troublesome … they think that you increased my workload …

but I would not … maybe because I am head of department … I just need to talk but the staff have to write it down, which they need to spend some time on ... ' C2

Secondly, some staff argued that the system is just a one-way information transfer function from schools to the management centre. This interchange of information may cause some interpretive gaps – because there is no face-to-face conversation involved – between school staff and managers at governmental level. As a result, the staff may have to pay more attention to the illustration of an event. For example:

'…for us the system is just for report [event], only the Department of Ministry of Education knows [event has happened]… particularly when they just know about parts of events with the objective cognition' C5

Third, it is reasonable to assume that staff may change their attitudes towards some events as they accumulate more experience or come to understand the roles of their organisations better. Indeed, each organisation may have its own sub-culture or taboos, which may influence some senior staffs' attitudes towards whether to report an event or withhold it:

'…firstly, the chancellor, did he consider things seriously, this is I can feel which is from top to bottom. Second, it is from bottom to top, if I am a junior staff, I may be more concerned with something because I am afraid of making a mistake … but I am afraid that after a few years when I changed be senior staff, did I change to not care about the procedure of reporting events or the influence of other colleagues' attitudes that the reporting is not necessary from my perspective [persional attitude toward managing of events]…' V2

Finally, although the system provides a control function for operators to prevent the expansion and deteriorating of potential threats, unavoidably the system may also cause secondary harm to clients if explored by media or staff as well. This not only causes harm to clients but also may be an invasion of privacy:

'…I think that this model has benefits and drawbacks. On the one hand, it controlled the accidental events of students early on and provided help to prevent the expanding and deteriorating of events. One the other hand, the

> privacy of clients may be explored by the media or another related department which may cause secondary harm to a client if the process creates new problems…' A4

Despite these drawbacks, there are many benefits of using the system from a staff perspective. Firstly, a preventative function may be one of the significant features for managing and avoiding events at school. It may improve the prevention function on some frequency cases such as traffic accidents and some potential events, for example, a student running away from home with a 'cyber friend'. As the following answer,

> '…firstly, we can react instantaneously; the second is the integration and analysis, which can also provide some prevention. It makes other units pay attention to it ...' S2

> '…prevention before an event happened; such as after the first examination in October … accidents may happen … they ride motor bicycles … we can pre-propagandize ...' A5

> '…we will remind teachers at the school affairs conference, that they have to give guidance on this aspect … if they have the support of some figures it may be better, such as how many cases of students running away from home after they met a cyber friend last year and this year, it shows that the trend is still there … also it can be used for propaganda [school activities/events during the term time] with students at the beginning and end of the semester ...' C2

Secondly, integrating event information provides a way of exemplifying based on similar geological, social and cultural characteristics, which will attract the attention of students. Consequently, the warning function may be improved by the integration of information:

> '…the analysis information came from the events of our city, which makes it more convincing. It can provide a warning function when events have happened at other schools but not at our school. So it may be more easily accepted by students ...' A3

> '…students will listen to it if it is historical information using the name of

> our school … it can provide an alert function ...' F3

Finally, the system not only has a data collection function but also contributes to the task of providing information and resources. Particularly in relation to the laws of the country, for example, if an event contravenes national laws such as the "Children and Youth Welfare Act" then system managers can provide guidance and direction to schools, which may not only avoid staff going against the regulations but also help them to deal with events properly:

> '…it may firstly provide a function of guidance if a school has never had experience of dealing with the events … Secondly, it indicates a direction of transfer the case to actual institutions [according to the low such case should report to government regimes such as police or social welfare department]...' C1

Both positive and negative opinions were presented by operators, depending on their attitudes towards and experiences of using system, whether it offered a bona fide prevention function or the reporting process simply increased their workloads. In order to explore the factors potentially causing the gap between different operators, it may be worth considering other potential problems within the organisational cultures of educational regimes.

6.5.3 Potential problems in organisational culture

As discussed in the previous chapter, when asked whether schools withhold events, most staff responded that such a phenomenon existed at their school although some staff disagreed with this suggestion. From the system designer's perspective, most of the events school withholds probably relate to problems involving obscure and unacceptable behaviour within educational culture. Such unacceptable events may not only impact the reputation of a school but probably also influence the enrolling of new students. For example,

> '…the problem of discipline or sexual assault, the problem in relation to sex is more obscure, such events often cause mistakes in risk management … because the different values may have different functions to deal with it … of course our manager, the director of school … the manager deals with the event according to the regulations but the president

often considers the reputation of the school and their individual paranoid idea ...' S1A1

Such unacceptable and obscure events may be classified as "taboo" in a local culture depending on how serious the associated problems are for the school. Although such events may be different according to the characteristics of students or schools, they can be grouped into three main categories potentially causing debate amongst staff about whether to withhold an event: problems between teachers and students, events that may impact on schools' reputations and a sexual harassment or assault events:

'…a school asked not to explore the problems between teacher and student, the second is important for the school reputation. The third is clients who have experienced sexual harassment or sexual assault...' A2

'…some schools think about protecting their reputation … some events may involve teachers in relation to male-female relationships … Schools hope do not report events, they afraid it may influence the enrolling of new students … some schools have reacted to drug cases, for future students, the presidents hopefully do not report it … another belongs to sexual harassment; schools do not like to explore this kind of event' B1

Obviously, problems between teachers and students are a concern for most schools because such problems not only expose the existence of troublemakers at a school but also indicate that there are problems between staff and teachers. Therefore, despite the issue of school reputation some events in relation to the discipline and ethical issues between student and staff at school may also influence staff attitudes. As can be seen below, schools are likely to (attempt to) cover-up such events:

'…a conflict event between teacher and student; many private schools have their own opinions about reporting campus events to the CSRC…' B3

'…it depends on the characteristics of the school, some schools even keep traffic accident events hidden … it is in relation to the attitude of school president, and the reputation of school because it may impact on the enrolling of new students … such as a school bus driver argued with student … the case was reported to the police station … it related to the reputation of school, the school refused to report it …' B2

In addition to conflicts between teachers and students, there is a second type of problem that may have an impact on a school's reputation. Generally speaking, there are three main causes of this type of problem. The first is drug abuse, which involves the law at national level and most schools will quite naturally want to avoid being labelled according to the illegal behaviour of a minority of students. For example:

> …the highest is drug abuse; of course every school tried to avoid that public think their school equal a drug divans.'B5

> '…the private school has a particular culture that they worry about the problem of enrolling new students…it may impact on the development of school….especially in the areas of drug abuse prevention …'C4

> '…it has happened a lot, a bullying and drug event on campus...but drugs less than bullying of students … reputation and avoiding reporting it are for superiors to deal with ...' A3

A further problem is caused by deviant behaviours of students such as bullying, stealing, robbery and fighting. These events not only show that basic discipline at the school has been compromised but also send out the wrong impression about student behaviour to parents, who may worry about exposing their children to such an environment. As a result, these events may influence the aspirations of future students. For example,

> '…something like a theft event at school harms the reputation of the school ...' A4

> '…students involving thievery, because it may influence the right to study …'C3

> '…student robs, because the enrolling of new student is a problem at private school, also such case will influence the reputation of school …'C1

> '…I heard about some private schools, because the enrolling of new student… it has a negative influence on school reputation … otherwise, like groups of student fighting outside of campus, or drug abuse, but I am not sure about the actual situation …'B4

> '…normally events that provoke a negative reaction from society, such as students attempting to sell illegal drugs or a serious fight event…'V3

These kinds of event can also be connected to family problems – including running away from home, domestic violence and traffic accidents causing death. These events not only affect students but also influenced by their families. Some events are covered by law, for example, domestic violence, is covered by the "Children and Youth Welfare Act"; some may be covered educational administrative regulations, for example, running away from home and not attending school for over three days; others may relate to parental aspirations:

> '…student running away from home … the president decided … the less trouble the better … ' D4

> '…a domestic violence case involving a student, it has reported by the counselling room … The President questioned why we had to report it but the counselling room had already reported the case …' F2

The final category can be classified under 'obscure events at school' and such events relate to the privacy of both client and offenders in particular. Although such events are covered by the "Gender Equality in Employment Act", it seems that in order to protect the reputation of school and client, some schools still may withhold events:

> '…sexual assault event, according to the decision from head of school … did not report and notify the superior, withhold the event … it is the superior's responsibility to make a decision …'D2

> '…sexual harassment, whether between teacher and student or student and student … the school will agree not to report it …' F6

Events with unacceptable or obscure aspects that may affect the reputation of a school will probably be withheld because such events not only harm the invisible reputation of school in the present but also may influence the visible enrolling of new students in the future. Therefore, both factors may cause some schools to be conservative on the reporting of events. As well as some negative attitudes being presented by the directors or heads of school such opinions were also expressed by colleagues at school as well. Some staff denied that the phenomenon (school withhold event) existed; some claimed

to have experienced it and believed the situation existed at their current school; others were undecided because they had not experienced it directly.

Those who denied the existence of the phenomenon presented a positive attitude with clear and absolute answers. They seem to believe that good communication internal to the school may alleviate some debates and concerns between them and colleagues at school. Otherwise, they are likely to believe that it is more effective to cooperate with other colleagues rather than dealing with events by themselves:

> '…actually it is fine, most colleagues know that we do it for school. We will not assign the work to a person. We will communicate with school. We will deal with events with the director of student affairs and tutor…' F1

Although sufficient communication and acting within proscribed roles may reduce hostile behaviour from colleagues, as I discussed in the previous chapter the seniority of staff in terms of time served may also influence the dynamic between system operators and their colleagues:

> '…because I have been at this school a long time; therefore, they know I do it for the school. They may give the benefit of the doubt … they know that this is my personality … I think that I have good interpersonal relationships' C2

There were some interviewees who could not confirm the situation of colleagues hostile behaviour exists in schools, as they had not personally experienced it. Even so, some of the answers given suggest a certain a degree of enmity in interactions that is influencing the overall dynamics of organisations. Significantly, some staff felt that their colleagues did not trust them; some had sensed hostility even though their colleagues had not voiced it:

> '…there may still be this situation, but just heard about it, I did not meet with it actually…' B1

> '…just a personal feeling, sometimes you may hear other heads of department saying that even though we disagree with you [the respondents are mostly military staff] we will still report the event ... just mistrust from their language … the system may cause some mistrust between us and the

heads of departments' D2

'…colleagues, staff and superiors do not directly tell you [the reporting of events is unacceptable by other colleagues] …' A5

Indeed, sometimes colleagues may keep their thoughts to themselves in order to preserve their relationships with system operators; however, such considerations may not be so important for the presidents of schools. Some staff commented that some school presidents may treat system operators as 'informants' when they report events to the government authorities:

'…it has happened, presidents may blame the staff if some schools' presidents hope you will not report it; however, based on the fact of events it is clear the president may still adopt a cautious attitude when asking to report the event … they think if they told you not to report the event then why does the Ministry of Education know about the event already…' A2

'…I am not, but my colleagues got annoyed because the president thinks that he is an informant. They will write a memo to the president if something bad happens at school … the president may ask whether the event has to be reported, they will consider the reputation of school … they hope they can withhold the event ...' F2

As it can be seen, some school presidents and administrative staff believe that the process of reporting of events through the system is tantamount to informing, because the reporting task may touch or encroach upon unacceptable taboos existing at schools. For those colleagues with negative attitudes, the system may be regarded as a channel for informing the governmental management centre. They seem to doubt the system's function is simply to report events. Furthermore, it is reasonable to assume that some system operators are also worried about whether they are under surveillance from the management centre. Consequently, in the next section, I will explore whether system operators are concerned about surveillance by the CSRC.

6.5.4 Possible debates and concerns about the system within organisations

In order to explore the different attitudes expressed by interviewees towards the issue of surveillance, I will now examine the opinions of system managers and operators

according to their responsibilities and position in the management framing. Before exploring the opinions of operators, I will first examine the system designer/manager viewpoint on the surveillance function. The answers given provided some interesting results, and both assenting and dissenting opinions could be found within the comments of the system designers and managers:

> '…there is no surveillance problem, otherwise, it does not matter, school can refuse to report in the normal procedure, report it or if not control it themselves …' S1A1

> '…surveillance is not our purpose actually. For some presidents because they think that reputation is important, they will think that "domestic shame should not be made public" … I think that those schools may believe we are monitoring them …' S2

> '…the word 'surveillance' has a negative connotation in Chinese but in English it can be simply supervisory … actually it is a surveillance system immediately from some points of view …' M1

> '…it should not, because the main task is linking people in each workplace and does not do it [reporting procedure] according to personal preference and favouritism …' M2

As one system designer points out, the decision to report is the operator's and the role of the management centre is to wait passively for event information to appear. However, another designer also makes the point that if a school adopts the attitude that "domestic shame should not be made public" then it may see the system as a form of surveillance. Attitudes toward the system tend to differ depending on their position within the system, designer, manager or user, but clearly even system designers and managers can have different viewpoints on the controversial issue of surveillance. Likewise, it would be reasonable to expect managers at the local government level to be similarly ambivalent about the system in this respect.

According to one head of city manager, the system has an information surveillance function that enables government to process and control events faster than the media, to prevent some of the secondary harm caused by media scandals or public outrage. At the same time, this means monitoring schools constantly, which can be interpreted as a form

of surveillance or simply control:

> '…the CSRS has to be faster than the media; therefore, as surveillance, it has to monitor schools every second and minute ….indeed, it is monitored each school when serious campus security even happens. Understanding the information in relation to event before or after the media explored it. It is not surveillance but control and understanding …' A3

Obviously, whilst most of the city and county managers welcomed the functions provided by the system for handling and controlling events, they tended to believe that the system was mainly a communication channel for schools to report events rather than a form of school surveillance. Although some managers seemed to be concerned that the system might be invasion of personal privacy, an issue which I will discuss later, most of them believed that the system improved the control and restraint function:

> 'I think that the question may be different for private and public schools, the attitude is probably different' B5

> 'This is not surveillance [from educational management regime to school] … it's just for immediate report and for appropriate control and restraint'B3

> 'Personally, I think that it cannot be used as surveillance [from the CSRC to school], it is about handling the condition in each school immediately…' A4

However, as one system designer argued above, some schools will be tempted to not report an event in order to protect the school's reputation and avoid the government intervening. Such phenomena may be distinguished in the following answer, and such behaviour may happen more often in private schools than public schools:

> 'I think that the question may be different for private and public schools, the attitude is probably different' B4

The system clearly has a reporting function, channelling information from schools to the management centre. In most cases, if schools want to withhold an event then the CSRC will not get to hear about it, unless the event is reported by the media. This means that, from a government perspective, the system cannot be used as a surveillance tool, as

there is too much scope for schools to hide what goes on within campus environment. There are also legal and political constraints on the surveillance function. As one head of city managers puts it,

> ‘Personally, I do not think the surveillance of schools is the main purpose of this system, but it seems that we could not exclude the function of surveillance. The major purpose of using of the system for the Ministry of Education is to control situations and collect information for providing recourses and helping to deal with the problem for schools. Nowadays, we live in a democratic society; in fact, all the systems in schools are normalized and legalized. No one can change or control it by surveillance.’A2

In the previous chapter I considered how city managers tend to collect and handle more information from schools because they have greater management responsibilities than school staff. The discussion above also provides some evidence to confirm this finding. Consequently, I will turn to examine the viewpoint of surveillance within school staff. Broadly speaking, school staff presented both positive and negative opinions towards the surveillance function of the system. Beginning with the positive opinions, some staff contrasted the system with their previous work experience, arguing that the system does not involve as much information collecting work as the military; some drew upon their personal experience or colleagues’ feelings towards the system, because they sometimes felt under pressure when operating the system:

> ‘…it is better than in the military; the military is more complex’ F1

> ‘I agree with it [the function of surveillance]…’ C3

> ‘…some managers may feel that they are under surveillance …’ D2

> ‘…I do not this thinking originally [original function was designed for surveillance]… but after I had served at school for a year … I felt that school’s attitude is fine if the event was a small thing. If an event is a big case such as sexual harassment or sexual assault, the school’s attitude may be stronger and resist … After that, I may think whether the Ministry of Education Department using the system for controlling or surveillance school ... ’ F2

> '…I think that this is a good function [surveillance], because whether an organisation or course, each needs an effective function for risk management …' F3

> 'Basically, I take an affirmative attitude. It depended on how to define the meaning of surveillance … if something happens and requires the intervention of the government; it is a good intermediary ...' V3

> '…I think that it limited a report time, made me feel a little under surveillance, actually I think that if you understand it more you may not have the feeling of surveillance …' F5

However, for the interviewees with negative attitudes, the system provided an early warning function for schools; some argued that the system improved the function of risk management; others likely classified that the using of the system was just a regular administrative procedure for report events, for example,

> 'I do not think so … the Ministry of Education Department cannot constantly monitor what happens in schools … it is a form of help, providing an early warning system for schools …' C4

> 'I do not think that is surveillance; this is risk management …' C2

> '…It is unlikely that it is surveillance. ' F6

> '…I think that the system just reports the condition of schools, it belongs to a report system … I think that surveillance is not the main objective. ' F8

> '…I do not think that this is a surveillance function….some system is good originally, despites you misinterpret it in purpose…' V2

Significantly, managers may develop particular attitudes toward the system's functions according to their personal experience, organizational culture or position in the hierarchy. As one of the staff above argues, each system has its own unique or utility function when they designed for organization originally. It is possible for system designer and managers to control a technical system's functions or establish a standard procedure but it may be impossible to influence the system operators' or other

colleagues' attitudes if they tend to misinterpret, or interpret in a specific way, the system's purpose.

Beyond the question of the system having a surveillance function, some people are concerned that reporting events means divulging personal information and an invasion of privacy. According to the response form system designers (see below), clients' rights and privacy issues have to be evaluated into the operation procedure. Otherwise, they seem to believe that reporting events not only enables the government to handle the situation but can also be used to provide help to the parties involved from relevant authorities through the transfer of information.

> '…it has not considered this part ... it [the report] has not influenced the rights of the clients, if we report the case some of them may get financial support from the government ....if there is an influence, then it is only one that is of advantage to them S1 (A1); F5

> '…I think that it is fine to notify the client if from the viewpoint of human right [personal privacy]… but the general procedure did not do it … we did not consider this issue … the report has considered an anonymous process … if from safety and policy viewpoints it is hard to give consideration everything … we can delete the name…' S2

As one of the system designers argued above, when making policy to manage risk it is difficult to balance the needs of policy and clients. Therefore, in order to prevent unnecessary troubles or mistakes that may cause secondary harm to students, the reporting procedure asks to delete a client's name if the event might invade personal privacy. In general, these events may be classified as gender issues such as sexual assault and infringement of the "Children and Youth Protection Act". Significantly, most of the staff complied with the regulations and showed a positive attitude towards the reporting procedure, for example,

> '…we used a code or number or just showed the family name on the report, the whole management team has reached a common consensus on this part' A2; C3

> '…it is possible; however, of course the priority is still to protect the party' B5

> '…we do not record the name; class, title only two items involved in the report, another record will not invade their privacy…' A3; D1; D3; F3

> '…if we do not report truthfully and accurately to superiors, how can they handle the situation … it depends on case, for example, gender issues should be sent with skill, and for example, car accidents should be fine to send out…' A5

> 'Basically, the report to the court of youth protection, it will use OOO will not show their real name … we will prevent a minor case …' B1; M2; F2; F4; V3

Some staff drew attention to the fact that it is impossible to report an event without permission and a password because reporters have to log-on to the system. The CSRS is a closed system, it is impossible for students or the general public to access it without a password:

> '…to log-on to the system you must have a password, therefore, it is impossible for general students …' C2; F8

Clearly, most of the staff thought that the event reporting procedures were sufficient to protect client rights and privacy; however, some of the staff were less convinced. One argued that if a retired member of staff, unsatisfied with the school or students and they got experience of operating the system, it would be easy for them to copy or revise data. As can be seen,

> '…if I was a retired member staff unsatisfied with students, he knows how to log into the system to change some information, this may cause a reputation problem…' D5

On the questions related to the rights and privacy of clients, there were some divergent opinions amongst the interviewees. Some had reservations about the system's ability to uphold human rights and maintain confidentiality. Others wanted more answers or guidance from the higher management level. There were also some who believed that the client has right to know the details of the reporting procedure and that it would be helpful to obtain the client's prior agreement to report. Such opinions are can be seen below in the following answers:

> '…of course, as I understand now; I am not clear about whether there is any conflict between this part and human rights … did the procedure contravene human rights, this part I do not understand … 'M1

> '…if the report is an invasion of privacy, they should ask the Ministry of Education Department to divide the responsibilities ….the execution is no problem…'F6

> '…this may discuss in related to the level of law; of course a party to the event has a right to understand how he will be dealt with. So, we may get an agreement from the party then deal with the following disposal…'C4; F7

Generally speaking, most staff agreed that the reporting procedure was set up in such a way as to maintain client confidentiality but some argued that it was possible to explore personal details and harm clients' privacy when through the system to transfer information. Practically, if an event involves a gender issue between teacher/staff and student, such as sexual assault, this puts the reporter under some pressure:

> '…if it is a simple accident, I think that is fine; if it is a sentimental case, this may invade privacy of client such as sexual assault in related to teacher or student…'C5

> '…I think that more or less may have…for example, if a sexual assault event happened we may have some pressure if the reporting information is incorrect…' D2; A4;

Although some staff expressed concerns about invasions of privacy, they probably still followed the regulations when reporting events – if only to avoid blame or punishment. This kind of hiding behind the rules is common in a hierarchical organization:

> '…maybe, anyway the system is orders from superiors. If it really involved the problem of privacy and prosecution by the law, this is an administrative order and the responsibilities should be carried out at the highest management level. We are just executors, only there to execute the order…'D4

Overall, most of the school staff followed the discipline of the organization to execute

the reporting procedure; some seems to evaluate a boundary between the discipline of organisation and right of client; others may stand on the viewpoint of the school side. It is hard to judge what is right or wrong in this situation because to be an user of the system, they not only have to follow the regulations of the organization but also have to adapt to requirements of their local organisation culture. Indeed, the development of a technological system improves staff's abilities to handle and deal with existing types of events but new risks may accompany the use of new technologies as well. One of the issues discussed in the interviews was that of students recording teachers' behaviour on their mobile phones and posting it to educational management regimes or the media, a trend that creates new conflicts between teachers and students at school. On the one hand, technologies are convenient for managers empowering their abilities of prevention and prediction events; on the other hand, technologies also create some challenges for managers. Therefore, the system operators may have to modify their attitude and mindset as well. For example,

> 'I think that we have to accept it … this is the nature of technological progress … the impact of technology depends on whether you use it in a positive or negative way … technology is convenient for us, which is why we use it in the system. We use this convenience to compress the time of reflection and warning; so I do not think that it is a big problem …' S2

When managers rely on technology to handle events they also have to accept the inconveniences that come along with it. Actually, technologies just provide some utility functions for people to manage or deal with events; but much depends on users' attitudes and concepts towards the technology's functions. As opinion respondent argued,

> '…there is nothing wrong with mobile phones; the point is how to enhance users' attitudes and concepts. All technologies are good when they come out. The kind of attitudes toward it from users; I think that we should enhance it from this viewpoint … Firstly, how you manage it. Second, educating children when they use it … just how you use and manage it …' A2

> '…there is an inevitable development … if relationships are not very

> harmonious between teacher and students, the condition will happen certainly … sometimes a student may be right actually, sometimes the teacher's position is correct; however, whoever is right, they will probably have a conflict if they've got different viewpoints. If conflicts happen, students have different reactions because everyone has different values …' V3

Even though the system's designers developed a standard procedure for operators to report events, some potential factors may still impact on operators' attitudes and valuations towards particular events, especially the pressure coming from the presidents of local schools. As the opinions expressed above demonstrate, the system managers not only have to establish a management function for organizational culture as a whole but also have to consider the potential impacts of local cultural contexts. The system designers developed a utility technical system to manage risks, but managers may have to evaluate how to educate the operators when using it. Using a technological system to handle events is almost inevitable, particularly in a hierarchical organization. Although the system designers built some categories of events into the management of the system, the increase of events has forced them to modify the categories again and again. As can be seen, the increase in new events was not only caused by society and nature but also by the use of technology itself, the outcomes of which partly depends on users' values and reactions. Such values reflect different interests among users and it is these that (as SCOT shows) need to be addressed when shaping technology to manage risks in a risk society.

6.6 Conclusion

In this chapter I have examined the interviewee's attitudes towards the system and the opinions of system designers and managers at the governmental level, as well as operators at the school level. It seems that in order to encourage a reporting culture, the system designers and managers not only considered how to help users evaluate potential threats at school e.g. making evaluation plans or providing funding for environmental improvements, but also devised sanctions for operators who refused to report events at schools. Such strategies seem to improve the information transfer ratio and have established a reporting culture within the overall hierarchical organisational framework. However, some conflicting results arise when we examine the differing attitudes

towards the functioning of the system and contrast the system managers to local operators. Such diverse results may reflect the personal preferences of operators or the *ultra vires* behaviour of directors at school; some of the differences in opinion are caused by organisational culture or the organisational dynamics between operators and their colleagues. Either way, it is necessary here to return to the questions first raised in the methodology chapter, where three key aspects of managers' or users' attitudes towards the system's functions were put forward for investigation.

The first issue relates to how a governmental agency records the data of campus security events to monitor the potential risks present and the different expectations of managers and operators about information. The interviews suggest that system managers are more concerned with how to handle and control information than dealing with events; meanwhile, local operators are primarily focused on dealing with events, as opposed to providing information upwards through the system, in order to avoid attracting blame or punishment. The system designers and managers interviewed argued that predictable events, e.g. seasonal tragedies, can be reduced by instruction or prevention strategies; however, sometimes the historical recording and information analysis tasks undertaken may be nothing more than perfunctory, the routine work of a bureaucratic organisation, because the policymaking of *other* government departments is not necessarily based on the findings of the annual CSRS reports. As for the operators, they expressed both positive and negative opinions towards the use of the system information to reduce events. As we have seen, some operators argued that local schools do not have the capability to analyze data, although some seem to have reduced the frequency of certain events by relying on historical information and similar experiences, combined with an awareness of their organisational and social-cultural context.

The second key issue for risk governance identified in Chapter Three was the relationship between organisational culture and campus risk. Here the data highlights how different organisations will be concerned with different kinds of risks, depending on how serious the potential harm of these risks is to the organisation. Judging by the interviews, the system managers seemed to be more focused on collecting and handling information for the minister of the department than the steps necessary to deal with events, their main concern being to avoid interrogation or blame from legislators, the media and/or society at large. Similarly, if the interviews are anything to go by, risk governance in schools often seems to be mostly about reducing the harm done to the

school and its reputation, particularly for private organisations. The main reason for withholding events at some private schools would appear to have little to do with protecting the privacy of students or preventing secondary harm to students, but rather avoiding potential harm to the school's reputation and the impact this might have on the enrolling of new students in the future. Even so, in general, most schools not only follow the reporting procedure to report events but also receive guidance from the system that may help them stay within the law and meet administrative regulations.

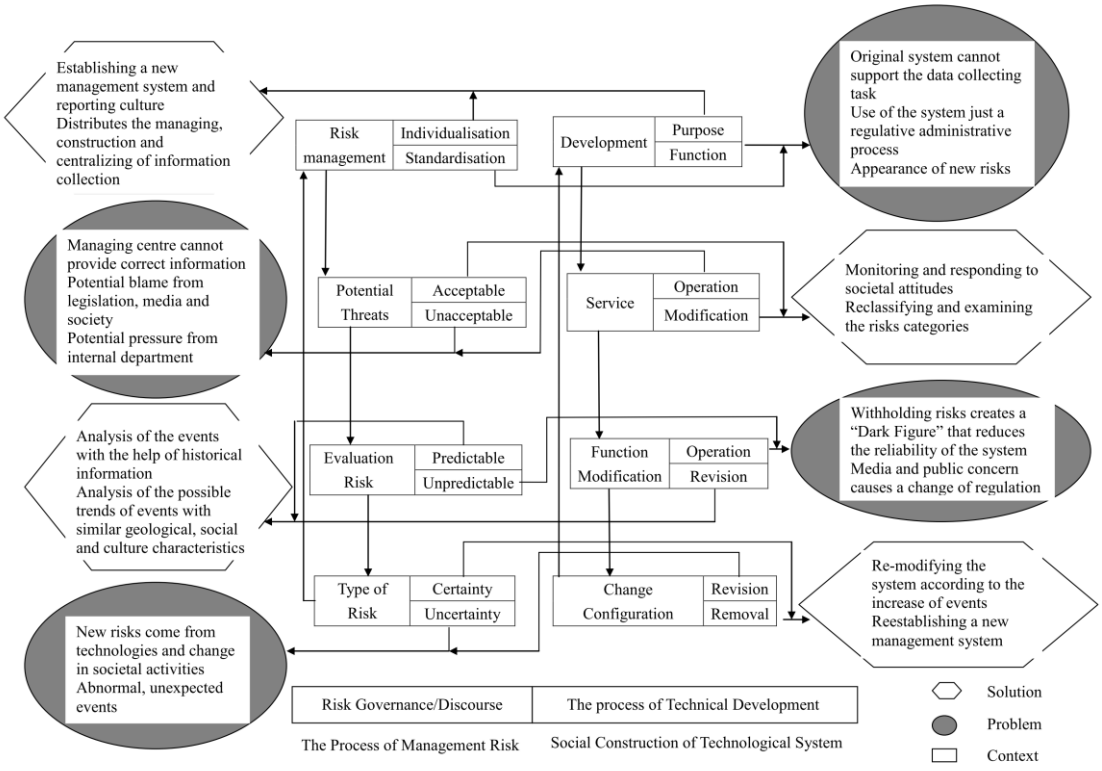
The third and final issue is to do with the importance of judgement in the operating of a technological system to govern risk. Here the interviews suggest that there is a difference between government managers and local operators. The system designers and managers believe that establishing a standard operating procedure and reporting culture has improved the collection of information and reporting aspirations in local schools. However, they seem to realize that the initiative for reporting events is controlled by schools and some schools are likely to go against the regulations and refuse to report events. Some school operators will report events according to the standard operating procedure, particularly at public schools; they may be classified as a more standardised management organisation. Some seem to pay more attention to the attitude of their directors than their administrative role, violating the basic regulations of the system and withholding events for the sake of the school, particularly at private schools which may be grouped into the more individualised management culture.

There is no doubt that the functioning of the CSRS has empowered system managers when it comes to controlling and handling events around the educational regimes. The system managers have had to modify the system function frequently in order to address an increasingly diverse range of events, student deviance and to avoid backlash from the media and wider society. Nevertheless, the functioning of the system not only allows operators to transfer event information, predict possible events and get resources or guidance from the higher management level but also provides schools with an alternative knowledge learning channel via the historical recording of data and similar experiences from their own or other organisations, although sometimes operators may have to endure the wrath of their directors or hostility of their colleagues because of their system role, as 'informants'. This influence of a system role also partly explains the contrasting attitudes towards the functioning of the system of designers and managers at government level to operators at school level. I have tried to capture these

general results in the models that appear in the charts below. These seek to establish the possible relationship and dynamic between the process of managing risk and the development of a technical system using the SCOT approach and applied to different groups of social actor across the system itself.

To begin with, the opinions of government managers (see Diagram 6.6.1) suggest that four processes have been integrated and factored into the development programme of the system. As the highest context shows, the original management function seems to collapse, which means the information collecting task is likely to be obstructed by a natural disaster at the educational regimes. A regular administrative management function may be used in a normal situation without potential threats; however, such a process could not prevent a massive disaster caused by a shutdown of the power supply between the management centre and local schools. Therefore, the alternative function of "Sound direction" was used to and not only defused the crisis but also caused the reshuffle of risk command inside the organisation, which in turn gave birth to a new management system with technical functions. Such a change seems to have increased capabilities of collecting and handling events information from the highest governmental organisation to local schools.

Diagram 6.6.1 The functioning of risk management in the CSRC and its management:



Secondly, although the system can help collect information and predict natural disasters, it may not be able to detect potential threats stemming from man-made ones. As the second step of the context highlights, three problems are unacceptable to the management centre, particularly when such problems may cause potential threats to the minister of the departments. As a system manager argued, if they cannot provide actual information to the minister, they may be vulnerable to blame from legislators, media or society; otherwise, the manager may have to face other pressures from outside of the organisation because the information recorded in the system is likely to be of interest or concern to ordinary citizens or NGOs. Therefore, managers may not only have to reclassify the events categories or regulations but also need to be aware of some potential threats from citizens and society when modifying the system's functions.

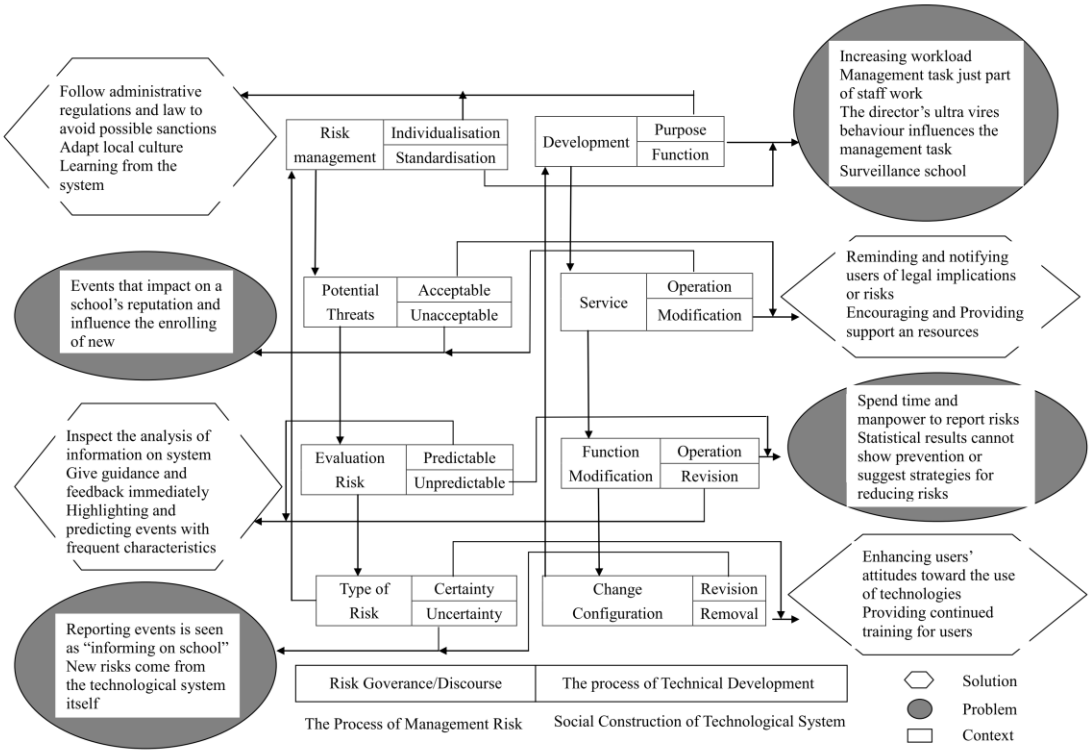
Thirdly, it seems that other unpredictable factors also influence the modification of the system. As the third step of the context demonstrates, the "Dark Figure" which is caused by the withholding of events in some schools may have an impact on the reliability of the system; also, the overreaction of the media to some events probably forced the system managers to change the original operating regulations of the system, because such concerns probably created potential threats to organisations or secondary harm to clients. Consequently, in order to enhance the effectiveness of the system function, managers not only changed the operational role of the system but also enhanced the analysis of historical information by introducing factors such as the characteristics of geological areas, communities or societies and culture.

Fourthly, as the lowest level of the context suggests, more and more new risks are created and accompanied by multiple social activities, as well as by the use of technologies and even technology itself in a risk society. Such outcomes may enforce changes of configuration and re-modify the system very often and they may not stop; therefore, when the present system's functions cannot support or cover all the new risks, the system managers may have to re-establish or develop a new system to manage the risks of risk society.

Having examined the managers' attitudes, it is now necessary to move the discussion in the other direction and review local operators' opinions (see Diagram 6.6.2). According to the top row, which details the development of the system, although the system allows high level managers to handle events, for some local operators, the system has increased

their workload and functions as a surveillance tool for the government. There are also the personal *ultra vires* attitudes of some directors, which may influence the management function in local schools. Therefore, in order to manage risks the local operators not only have to adapt to the sub-culture of local schools and follow their administrative role, even national law, to avoid possible sanctions but must also learn from the system records to prevent events with the similar events characteristics.

Diagram 6.6.2 The functioning of risk management at the CSRC and its management: Local Operators



Apart from this, there are some potential threats that may influence the task of managing risk if events are sensitive in nature or may impact the reputation of school. As the second row regarding the service of the system highlights, it seems that reporting events to government regimes may expose the lax discipline of schools and influence the enrolling of new students further. The potential threats will not be caused by events but from the action of reporting events to higher managing regimes. In order to avoid such phenomena the system may improve the function of reminding and notifying the operators; such a function would not only encourage and provide resources to operators but also keep them on the right side of the law, as well as making the system functions more acceptable to local schools.

Moreover, according to the third row, in relation to the function of modifying the system, some operators argued that the reporting of events not only wasted their time in a routine administrative process but also consumed school manpower (when dealing with events, having staff at the scene is sometimes more important than reporting the event upwards). Consequently, two functions may alleviate the concerns of local operators. Firstly, in order to reduce or prevent events the system may highlight some predictable events particularly focusing on events with frequency characteristics. Then, for enhancing the prevention function on events containing many unpredictable factors the system probably has to improve the inspection and give guidance or feedback immediately. By doing so, the tasks of evaluating risks may make some unpredictable events more predictable and manageable for local operators.

Finally, as the lowest row in relation to the change of system configuration suggests, despite the system providing much support and resources to local schools, operators are still often classed by colleagues as ‘informers’, especially junior staff. Moreover, most of the interviewees seem to agree that new risks accompany the use of technologies or emanate from the technology itself as well. Although technologies have increased the capability to handle and prevent events, sustainable risk governance requires the continual revision of technical management systems and their functions. Therefore, when using the technologies the system should not only enhance users’ concepts and attitudes toward its function but must also provide ongoing training to reflect the changes in system regulations or roles and the increase of events, until the system function cannot support the tasks of risk management. At this point, the system might be discontinued and replaced by a new management system.

Chapter 7 Discussion and Conclusion

7.1 Introduction

This thesis has tried to explore and distinguish the interaction and dynamic of risk management through examining the development and operation of a socio-technical management system and observing its modification and revision process within a hierarchical organisation. Any organisation may develop some managerial functions or systems to monitor and manage unpredictable and unacceptable risks according to its unique culture, wider social expectations or regulatory demands of government. The aim of my thesis is not to judge, argue with or criticize risk management tasks within contemporary society, but to explore how, in practice, a technical management system works in a modern socio-technical society (in Taiwan); and within this context a society that regards technology as providing a means through which social ordering and the management of risk can be enabled. I focused on a socio-technical management system (the CSRS), which is designed by the government agency at the national level, relying on modern technology to identify, integrate and manage the phenomena of risks and 'accidents' occurring in the everyday life of schools and colleges in Taiwan.

In this chapter, I present firstly a brief summary of each chapter, suggesting how these together explained the scope of risks which are created by everyday events causing different concepts and attitudes toward the functioning of risk management system in a hierarchical organisation between managers and operators, my results helping to answer the questions which are debated in the thesis. I then discuss risk management as a reflection of culture and social construction which shape the functioning of risk management processes in risk society. Also, I present some limitations which review some self-critical comments on the thesis for further researchers who are interested in similar topics. Finally, I make some comments which offer some general suggestions to risk managers and provide some suggestions reflecting on the management framing of the CSRS itself.

7.2 Overview of the thesis

The main purpose of my thesis is to examine the processes and problems of risk governance within the functioning of a socio-technical system in a hierarchical organization. The campus security events occurring in Taiwan may also be found

elsewhere. My thesis explores the viewpoint of operators across the CSRS which are collected from different levels of the system based upon the importance of seeing different interests and perspectives, as suggested by the SCOT approach. Bijker et al (1989: 28) highlight 'the developmental process of a technological artifact is described as an alternation of variation and selection'. The structure of the CSRS is built on an information technology (IT) system which relied on the IT system to link the relationships between the system designers/managers and operators/users. I explore the actual problems of operators of the CSRS and the solutions they deploy (part of the 'variation and selection' process) as different groups of people, which included the system designers, government managers, policy practitioners and regional/local operators. The CSRS was built by an educational system which could be classified as a hierarchical organisation which expresses a high grid/group culture because the management framing of the CSRS was established and constructed in a highly bureaucratic way, and as was seen, shaped by a reporting process that in both actual personnel terms and culture was somewhat militaristic.

This thesis started from the exposition of risks management ideas, focused on the daily risks happening in schools precisely because they are 'everyday', often quite mundane, yet potentially posing as much organisational challenge as major disasters, such as earthquakes, which can, quite literally, cause organisational collapse. To this extent, in chapter 2, I traced the concept of risk not only looking back to its original meaning but also explored its change through the evolution of social phenomena and activities; then I discussed its characteristic through the factors of scope, standard and evaluation; finally, the literature section examined it more theoretically discussing some theories in relation to the issue of "risk governance" including Foucault's "Governmentality" (Foucault: 1978); Douglas' "Culture Theory" (Douglas: 1992) and Beck's "Risk Society" (Beck: 1992). As Douglas (1966: XIX) suggests, the discussion of risk is likely to be a dilemmatic issue if the problem involved has both moral and political dimensions, because such debates may touch potential taboos or concerns that pose risks to organisation or society (Douglas 1978: 1). Significantly, most organisations or societies have their particular concerns of managing risks depending on how important the risk may be seen to be. Therefore, I particularly applied the concept of four types of social environment which is presented in Douglas' (1978: 7) "Cultural Bias" to explore some possible differences existing in organisational culture.

Methodologically, I believe that it is crucial to understand the task of risk management by focusing on culture, knowledge and technology individually. In order to answer the research question I examined managing risks within the approach of SCOT. Consequently, I developed a three part case study to collect and explore the tasks of risk management (the CSRS) in a hierarchical organization – including the analysis of recorded data (over 5 years) in the system, examining the system operators' attitudes toward the use of the system with quantitative research and relying on qualitative methods (face to face interviews) to explore some potential problems and the dynamics of local organization, from the system designers/managers to local operators. Such methods not only examined the actual phenomena and situations of managing risks but also explored the interaction of organizational culture and sub-culture between operators at local school and managers at a government level.

In Chapter 4, firstly, I explored the management framing, procedure, the classification function of risks, and the database of CSRS, then examining the annual report which is published by the CSRC at government level. Significantly, establishing a socio-technical management system not only improved the government abilities on governance and monitoring of risks but also constructed a communication channel between local schools and educational management regimes in Taiwan. Moreover, the system categories and sub-categories have been modified several times, showing that the using of a technological system may not only require some regulations or discipline from top-down management framing but the system managers or designers also have to consider the voices, experiences and potential problems from bottom-up within the organisation. Drawing on Douglas, the CSRS appears to contain a high grid/group relationship in educational management, an organisational structure (a form of 'solidarity') that seems to generate the huge volume of risk data loaded into the system. Indeed, the analysis of historical data not only demonstrated some significant trends and potential patterns of risks but also suggested that risks appeared at particular type of schools caused by the different expectations of individuals, organisation or the wider society. This suggests that a technical system improves the abilities of risk management, which could be supported by the analysis of historical data; however, some aspects of interaction across members within the organisational culture may influence the effects of managing risks between local school (sub-culture) and government (hierarchical culture).

In Chapter 5, I consequently examined the system operators' opinions and attitudes toward the system's utility, the organisational obligations and the right/privacy of clients with the help of statistical results from my questionnaire survey. I then explored some potential and possible problems which may influence organisational dynamics and managers' attitudes existing at the local level. The statistical results suggested that participants presented similar opinions toward the system function; however, when the discussion regarded some specific issues, such as the system surveillance function and privacy issues, they show different attitudes, contrasting the senior staff to junior ones especially. Such results seem to suggest that in a high grid/group organisational culture, as Douglas point outs, in order to reduce risks effectively the constructing of a socio-technical management system may not only have to establish some discipline and regulation but also has to accept and adopt sub-cultures, within the solution function of SCOT. By doing so, this can solve many potential problems behind the local organisation.

In chapter 6, I examined the system operators' and managers' opinions and experiences toward the using of the system through qualitative interviews. In order to explore a wider interaction and dynamic across the whole management framing of risk, the interviewees included the system designer/managers in government, the city manager who is policy practitioner, and the system operators at local schools. The results highlight that participant attitudes toward the system function and the impact from risks to organisation may be different depending on how many responsibilities they carried when managing risks. Government managers tended to handle risks more than dealing with them; it seems that they were more concerned about potential interrogation and blame from legislators, media and society than risk itself. However, the system operators tended to not only deal with risks but also tried to avoid some potential harms which may affect schools' reputation and prevent some consequent side-effects which may influence the enrolling of new students. So, it seems that the functioning of the system may be different across groups depending on personal requirement and attitudes toward the using of the system to manage risks.

7.3 Discussion

In order to explore and distinguish the research questions discussed in the literature chapter some general findings and results are integrated through the comparison of the

material from the three parts of my overall case study. The first question explored the scope of risk which is created by these everyday events and how are they organized or sorted (Bowker and Starr, 1999) through a process of classification.

The exploration of risks in relation to people's concepts of organising, sorting and classifying of risks shows the concept of risk is likely to be influenced by personal experiences, social perspectives and the perceived possibilities of potential threats from risks in the outside environment. This then is reflected in the way in which risks appear: if risks had some high frequency characteristics their boundary may be evaluated and calculated, such risks may appear on particular times of day or month (Lupton, 1990), some are linked to specific gender groups (see for example Beck 1992: 104-106); others seem to be created by special weather or environmental conditions (Kasperson and Kasperson, 1991), others tended to reflect wider culture (see for example Douglas and Wildavsky, 1983). On the other hand, if risks were regarded as more uncertain most of the managers seem to present risks as hard to distinguish or track by studying the statistical figures; particularly, when such uncertainties were linked to sporadic and latent factors, not only be influenced by a single factor but resulting from the interaction of a number of social processes (see for example Webster 2007: 49), personal behaviour (Douglas and Wildavsky 1982: 18), or seen to be influenced by outside pressures like primary family, peer group and local culture (as Thompson, Ellis and Wildavsky 1990: 179); others are created by the using of technologies (Beck, 1992) such as cyber crime or recorded conflict related to mobile phones.

Moreover, examining the operation of the CSRS suggests that the classification of the risks was not only influenced by these perceived threats but also reflected the relationships within the system/organisation itself (see Douglas and Wildavsky, 1982). For example, as explored in the CSRS, in order to handle risk, managers working at the governmental management level used the system not only as an administrative discipline but also to provide some local benefits which alleviated possible concerns about using the system (such as its impact on the *reputation management* of the school), through giving financial support or providing an environmental safety assessment and notification of laws relating to this. Moreover, the system managers might provide ongoing training to reflect changes in the system regulation especially when the system function cannot support the task of risk management, and when managers may consider replacing the old with a new management system.

To extend the concepts above, my second question asked whether the severities or seriousness of risks could be calculated and standardized by the organization. It is likely that the calculation and standardisation of risks may be influenced by managers' attitudes toward risks depending on how confident they are of acceptable or unacceptable risks to be taken by the organisation (Douglas and Wildavsky, 1982). Significantly, both quantitative and qualitative research results show that managers' attitudes toward the calculation of risks are likely not only to be influenced by the responsibilities of their working position at different management levels but also affected by the attitudes found within the local organisational culture (Morgan et al, 2000). As the qualitative results present, managers serving at the highest administrative level are more likely to be concerned with handling risk than counting the number or seriousness of events. It seems that the priority of understanding risks focuses on controlling risk information abilities more than dealing with it (Douglas, 1985) because some potential threats from legislators, media and society to the organisation may cause more serious and unacceptable harm than risk itself to organisation (Beck, 1999). Therefore, the system managers may be more concerned with developing prevention strategies on reducing risks at the governmental management level; such phenomena may reflect the fact that although the analysis of results of the CSRS highlighted and calculated many potential trends and possible tendencies of risk-related events, events still increased gradually every year.

Significantly, examining schools managers' opinions toward the calculation of risks shows that when they consider and assess the harm of risks to the organisation, staff adopt a variety of positions, confirming accounts in the wider, existing literature (Renn, 2008; Douglas, 1985, 1992; Lupton, 1999). So for example, when exploring the process of reporting events to the CSRC, managers with higher status and longer seniority were more likely than junior staff with lower rank and less experience accepted by colleagues when they dealt with and reported event at local school. It seems that manager with sophisticate experiences likely more than junior one who are unfamiliar with sub-organisational culture accepted by other colleagues when dealing or handling risks at organisation because those senior staff likely more than junior one understand and adopt the dynamic and interaction between themselves and other colleagues of school. The results likely suggest that the calculation of risks could be achieved by the standardisation of regulation or procedure even law if the process of managing risks are acceptable by most organisation within hierarchical culture; however, if risks

management task contained some potential threats, or possible harm to local organisation those managing procedures probably are unacceptable by most organisation with an individualist culture.

My third question explores whether the personal perceptions of risks by managers conform to or modify the formal meanings of risk as set down by the system. According to the results from exploring the CSRS, the categories of the system have been modified several times which achieved some flexibility in the system in terms of evaluating and governing risks (Douglas and Wildavsky, 1982); indeed, as experiences using the system highlight that new types of risks not only increased through some multiple social activities or personal behaviour but also concerned with other diverse factors such multiple factors; some seem to be created within the organization, some may come from the pressure of society and media; others probably result from the change of policy making (Beck, 1992). In terms of reporting risk, most of the managers reported that a school tended to withhold events in order to protect the reputation of the school. Therefore, it is reasonable to suggest that standard reporting procedures depend on these interpretive judgements existing within the local sub-culture (Douglas, 1992); the phenomenon of the "Dark Figure", as it was described, seems to support not only such a viewpoint but also highlights that the sub-culture truly influenced the validity of the evaluation of risks. Therefore, in order to improve the functioning of the management risks and achieve the effectiveness of evaluation risks cross the diversity of campus security events, the system managers not only tried to establish a risk governance culture with some coercion strategies, such as establishing a reporting culture and using sanctions according to law, but also had to understand local practices and concerns and consider some possible benefits derived from greater support and consultation with local staff.

The final question focused on whether the management of risk reflects the wider context within these hierarchical organizations. As most of the system operators argue, risks may contain many characteristics with uncertainties; some are likely to be caused by environmental factors such as sporadic events like 'food poisoning'; some to do with the unforeseen behavior and potential threats such as 'suicide' (Turner et al, 1990; Hillson and Murray-Webster, 2007); others seems to be created by the using of technology to report conflict existing in the local culture (Douglas and Wildavsky, 1982), for example, students using mobile phone recordings of a conflict event between

teacher and student at school. Therefore, if risks are involved with a wider range of uncertainty characteristics they may be hard to prevent, predict and alleviate with the help of analysis of the historical record or improvement of the system function, because risk may evolve from more and more complex threats and their interaction (Beck, 1986; Marjolein, 2000).

In general, establishing a useful technical management system is expected to handle and control risks which may cause threats or create harm to organizations within a hierarchical culture. As I highlight in the literature review chapter, there are many theories that have provided useful and effective concepts and constructions to approach and explain risk management in the social science field such as "risk governance", "risk society", "culture theory", and the "SCOT" approach Among those theories, some explained risk via particular reference to an organization's culture; some explore the interactive shaping of risk via social action; others focus on the function of risk management itself. From a risk management perspective, in order to handle or manage the diversity risks that are likely to be met, the system managers may not only have to consider many possible standard processes but also establish some formal procedures that staff must follow to ensure the functioning of the system and the effective management of risks. This 'disciplining' of behaviour and the governance it produces relates to Foucault's (1978) perspective on the ordering of behavior through forms of socio-technical control. In theory, therefore, the system operators have to report risks to the management centre without withholding any events, and through following quite specific rules and guidelines on reporting. Indeed, the analytical results of historical data presented many possible trends and patterns of risks with high levels of predictability, and such statistical results and the trends that they show would normally be regarded as the basis for a systematic revision of policy, where needed, to ensure that the risks could be disciplined and reduced in the future.

However, in practice, as my empirical material demonstrates, the statistical results show that managers have quite different attitudes toward risks, and, as many of my respondents observed, local operators did not deal with such risks according to the expectations and requirements of the hierarchical management culture but were much more likely to deal with them through localized practices and conventions, contrasted especially between public and private schools, senior and junior staff or male staff to female ones. Overall, this suggests that it is important to consider not only forms of

governance, but how in practice risks are perceived and managed: one of the limitations of a Foucauldian position is that the identification of powerful discourses of risk does not explain the diverse interpretation of risk, nor the uncertainties surrounding it.

The modification of the system categories was one way of coping with new risks with a degree of certainty. Obviously, a socio-technical system may adjust its function to be more flexible in the risk society, as Beck (1992) suggests, even though this itself may simply 'manufacture' new risks. For example, the sub-category of 'suicide' was subdivided into three sub-categories because of the concerns and pressures both internal and external to the organisation. However, the phenomenon of "reputation management" seems unable to be classified into any categories of the system. It seems that the new type of risks were not only manufactured by the use of the technology or technology itself but also created by the users' attitudes and the wider organisational culture toward risks in risk society.

The management framing of the CSRS could be classified as a high grid/group bureaucratic culture and the existence of a highly coordinated and cooperative form of 'solidarity', as Douglas (1978) might argue, which achieved the system's need to identify and manage many risks with both certainty and uncertainty characteristics. Obviously, exploring the operating and functioning of the CSRS reveals that as the actual meaning of risk involves cultural issues with many uncertainties, it is clear that the complex process of risk governance seems to be influenced by the interaction of people with and the dynamic of their organisational culture; therefore, the task of risk managing and the biases of culture may interact as what I see as a feedback loop. I argued that the managers in the CSRS are located within a high grid/group hierarchical culture, and so, perhaps, we should not be surprised that some are likely to be suspicious of the system's function to handle risks if they negatively impact on the reputation of the school: loss of reputation is the bigger risk, for it directly threatens the shared (high) group culture. At the same time, I also showed that managers may also worry about the reporting process where it is seen to invade client privacy or appear to be just used for the surveillance of the school or its staff. Here the limits of the group culture come to the surface. Such phenomena and concerns probably create many problematic and hesitant attitudes toward the use of the system to deal with risks which were evidenced by the arguments from both the system managers and operators. In general then, Douglas's culture theory provides an effective way to help us to understand risk in a

hierarchical organisational culture, and to explore the organisational culture toward risks; however, it seems unable to examine the whole process of dealing with risks and the development of a technical management system in a risk society. As the results of my thesis suggest, when faced or dealing with risks, peoples' attitudes may change depending on the responsibilities that they have and the coordinating effect of a group culture is therefore more limited. Therefore, my thesis seem to suggest that culture theory provides a useful path in regard to approaching risk governance but the high grid/group organisational concept has its limits if we try to explore and explain the social process through which risks are managed fully. Consequently, I argued we should adopt the concept and structure of the SCOT analysis that offers a complementary approach to help us to explore and construct the path of development of a technological management system especially in terms of its 'variation' and 'selection' of what is seen as more effective or acceptable responses to a subset of 'problems' that different groups within the organisation experience.

Overall, therefore, the results of my qualitative research seem to suggest that risk management could be improved by a standard operating procedure and systematic categorisation of risks; such tasks relied on a high grid/group organisation to establish a technical system with a standardised management function: as Loader (1998: 8) suggests, the use of technologies sometimes acts not only to define social or economic structure but also determines modes of human interaction. However, in order to develop an effective and functional system, the system designers not only have to establish a standard function for surveillance and governance risks but also need to understand some possible or potential impacts and concerns existing between the local and governmental levels; such factors, including the diversity of organisational function and variety of culture and practices across the organisation, if integrated effectively when creating or development a software or technical system, can lead to a more effective regime (see Pollock and Williams 2009: 32-33).

7.4 Modelling risk management processes

As I presented in the previous chapter, the purpose of my thesis is nether to develop a thoroughgoing critique of the contemporary social theories in relation to risk management nor to establish or develop a new theory but has tried, informed mainly by Douglas' grid/group theory and the SCOT approach, to explore and model the

functioning of risk management in a socio-technical system within the cultural context of Beck's 'risk society'. Consequently, in the following section I apply the concept of the SCOT to construct the possible modeling of using a technical system to manage risk management within a cultural context, drawing on my results to map the range of problems and provide some possible solutions function located at each stage of managing risks. According to the integration of my research results, my modeling of the functioning of risk governance tasks may be divided into four stages primarily those of what I call 'pre-risk' which examines the function of risk management and condition of development of technology within a cultural context, 'potential threats' which discusses the acceptable and unacceptable threats and the operating of a technical system within a cultural context, 'current risk' which explores the evaluating of predictable and unpredictable risk and the function and modification of a technical system within a culture context and 'post-risk' which explores the type of risk and the revision/removal of a technical system within a cultural context . I now outline the model in the following section.

Pre-risk

In the pre-risk stage, firstly the interaction of risk management and the dynamic of development of a socio-technical management system can be understood in terms of two types of culture – including individualist and hierarchical (see Diagram 7.1). I begin with the problem related to the standardisation of risk management in a hierarchical organisational culture (see bottom left of the diagram). It seems that three offending issues are likely to affect the task of risk management in risk society, for instance, new risks may cause a failure in the original management system which reduces the effectiveness of managing risk; also, the using of the system is likely to become a routine administrative task which weakens the system's function of reducing risk; and finally the turnover of staff means that new staff are unfamiliar with the system. In order to avoid such potential compromises to risk management, the management centre may provide some possible strategies and establish the standardisation management function to reduce the impact of risks, such as, developing a standard operating procedure (SOP) which given a guidelines for manager to deal with risk, or establishing a operating culture which helped to communicate and transfer information of event in order to distribute the managing construction and centralize the information to handle risks.

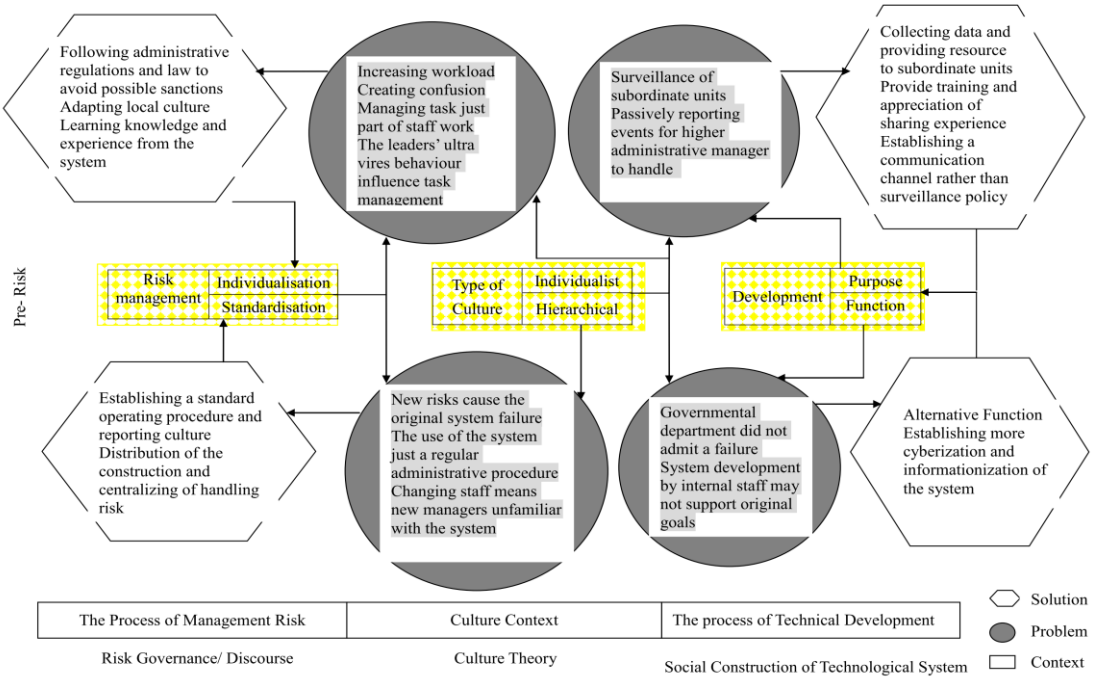
I then focused on risk management from an individual perspective (see the top left of the diagram). As can be seen, examining the tasks of risk management from this viewpoint, some people seem to believe that the technical management system has probably increased their workload and created more confusion when they deal with risks. Some argued that managing risks normally belongs to part of staff responsibilities elsewhere in the organisation. Others highlighted that sometimes the *ultra vires* attitude of directors may create a dilemma toward managing risks between manager's judgment and leaders' power. Therefore, in order to alleviate such potential problem existing, managers may not only follow administrative regulation to avoid possible sanctions by law but also try to adopt local cultural understandings within the dynamic of organisation and the leadership of the department because the interaction and dynamic of local organisation likely standing a significantly role when dealing with risks. In doing so, managers can try to extend the system function from simply using it to learning experience and knowledge from it.

There were other problems identified in my fieldwork relating to managing risks (see bottom right of diagram). As can be seen, governmental regimes seem to ignore failure to reduce or handle risks. Consequently, in order to manage risks effectively, a hierarchical organisation will not only develop a socio-technical management system but also have to consider other alternative ways, which is kind of backup plan such as the function of 'sound direction' when the original reporting system failure causing by natural disaster, for managing risks which improves the system by reducing human participation, and moving towards a more automatic recording of risk.

In addition, the development of a technological management system seems also to create some doubts among users (see top right of diagram) particularly if managers argue that a technical management system was designed for surveillance of the local risk managers within schools. As some of my respondents also observed, they may either report events passively or believe that reporting events is just for higher administrative managers to monitor risks but not utilized properly for future action. Therefore, in order to solve such concerns designing a socio-technical management system not only has to consider the collecting of information but also ought to support some possible resources, provide training and share experiences to end users as much as possible. Moreover, the system managers may try to alleviate some possible doubts which caused users concern, such as, focusing on establishing a communication channel

rather than developing a surveillance approach to framing the management of risks.

Diagram 7.1 The functioning of risk governance in the development of a socio-technical management system within a cultural context in pre-risk stage



Potential threats

Here I am interested in possible or potential threats and their likely influence on the operating of a technical system to manage risks (see Diagram 7.2). According to the model (see the bottom left of diagram), it seems that some potential threats are unacceptable which may not only relate to handle of event but also regard to the reputation protection on both organisation and managers/director in a hierarchical organisation if they affect the organisation's overall ability to manage risk. For example, if the management centre is unable to collect and provide information about possible future threats, this may lead to criticism and blame placed on senior staff by legislators, media and society. Besides this, the system managers may have to bear some potential pressure in trying to anticipate unknown side-effects from risks. In order to reduce and solve such unacceptable factors the risk management tasks will not only involve having to enhance management's ability to anticipate risks – such routine goals likely can be achieved by analysis of historical data which distinguished some potential risks with the prediction of events frequency or trends – but also to respond to the possible concerns

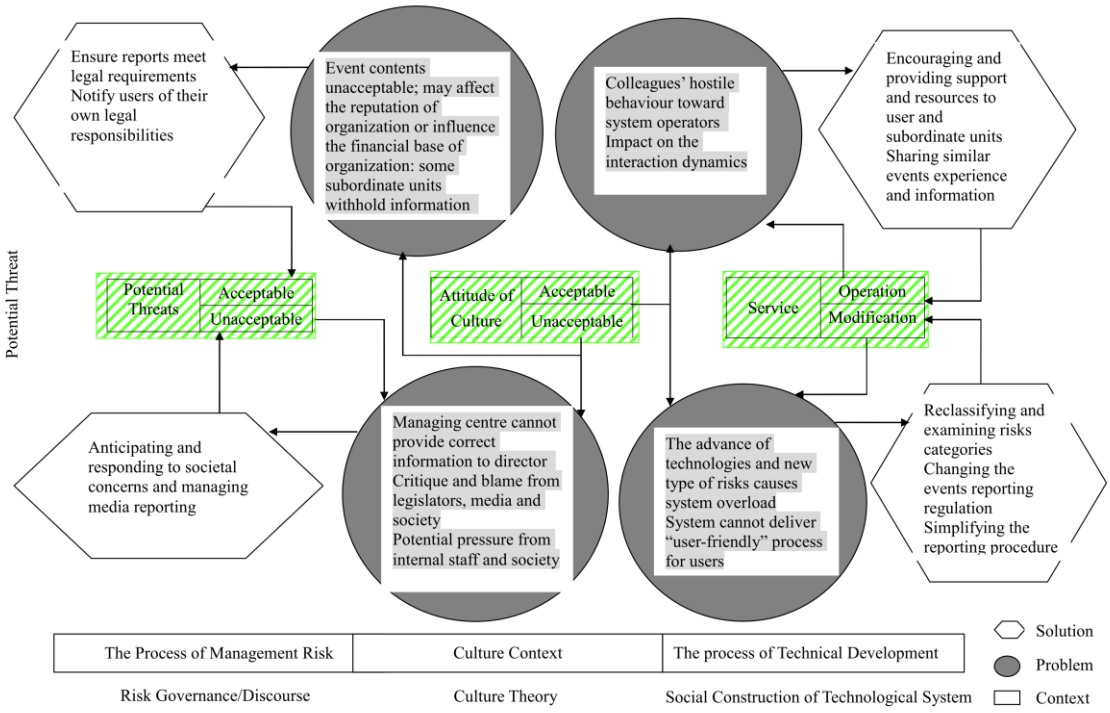
from wider society and even to deal with the media which avoided the second harm from society or media.

Moreover, some potential threats and their likely side-effect are unacceptable if the risks concerned impact on the reputation and so the financial status of the organisation (see top left of diagram). A good example was that many schools tended to withhold information about some risks in order to avoid some possible impacts not only on the schools' reputation but also the enrolling of new students because new students are the source of income for schools. In order to prevent such potential threats, one of the effective ways may be to establish an operating procedure that may not only notify and help users to follow the standard procedure in using the system - to give them an "early warning" – but also to identify those risks that must be reported upwards as a legal requirement. Given the strong military culture (as noted in Chapter 6) informing the Taiwanese case, this may be easier to do than might be true elsewhere.

Other unacceptable threats may impact the functioning of the technical system if there is 'risk overload' generated by the very system itself through the advance of technologies or new types of risks (see bottom right of diagram). Indeed, some system users argued that the system was unable to deliver or provide a "user-friendly" environment for them. In order to solve such potential threats, a technological system may not only have to reclassify/re-examine the classification of risks or change the regulation of the report process but also ought to simplify the actual procedure of reporting risks. The modification of tasks depends on the frequency with which new risks may happen and the advance of technology itself.

Finally, other unacceptable threats relate to the perceived surveillance function of the system, not itself an explicit objective when first established (see the top right of diagram). As can be seen, some system operators might have to accept or endure a hostile attitude and behaviour from colleagues because operating the system may be regarded as informing of other users/staff with a negative impact on collaboration in the organisation. In order to avert such a threat the system managers may not only have to encourage or provide/support resources to users but also to share the experiences and information of dealing with similar risk over organisation management framing within the system in order to improve the managers' abilities of handling risk in the organisation.

Diagram 7.2 The functioning of risk governance in the operating of a socio-technical management system within a cultural context in potential threat stage



Current risks

Third, in the current risk stage, some problems may not only have an impact on risk evaluation but also influence the modification of a technical management system within its cultural context (see Diagram 7.3 below). Beginning with the problems in relation to risk evaluation (see bottom left of diagram) evidence shows the analysis or evaluation of risks is likely to be routine or perfunctory and simply a bureaucratic procedure. Furthermore, as a system designer argues, the "Dark Figure" of unforeseen current risk may impact on the reliability of the system because it is hard to determine how many risks have been hidden across the local organisation. Such phenomenon may also influence the prevention capabilities of reducing events at the level of practice. Also, government managers may find it hard to determine an effective approach to the analysis information through the system because it was primarily designed to record and manage risks rather than evaluate the effectiveness of the results. Moreover, current risks may be difficult to classify and deal with in terms of identifying trends as they may reflect clients' individual family or social circumstances. Otherwise, it can be difficult to determine which was the main-event and sub-event when manager used the system. In

order to improve the task of risk evaluation, system managers would need to analyse the characteristics of current risks but also ought to understand the cause of risks with the help of historical data. Moreover, risk managers might not only integrate the range of risk information more effectively but also provide examples to users with similar environmental, social and culture characteristics across the organisation such as provide both positive and negative knowledge to student, using and applying particular figures, trends and cases to empower both managers and students abilities of awareness or avoiding events, and establishing the characteristic of event in related to the cause and sharing this to staff and students.

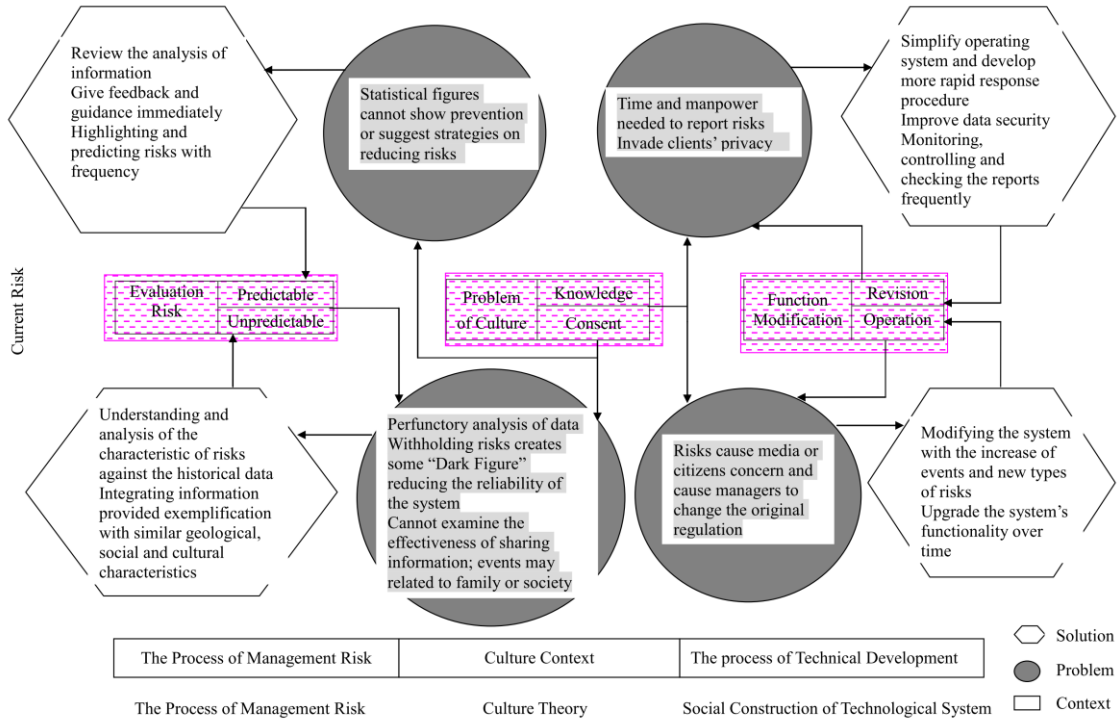
In light of this, as the exploration of the CSRS suggests, some possible patterns and trends may be presented and distinguished by the analysis of historical data; however, while such statistical results seem to highlight some figures they are unable to suggest or provide actual strategies for reducing risks (see top left of diagram). In response, a technical system manager might not only have to inspect the analysis of information and highlight/predict risks with specific frequency characteristics – such as focuses on frequency risk and those risks which, regardless of frequency, cause serious damage – but also ought to give feedback and guidance for users as quickly as possible.

Other problems relating to current risk management come from outside of the organisation and influence the operation of the technical system such as the concerns of citizens, media or society (see bottom right of diagram). As can be seen, when risks are caused by the media or public concern, some of the classification will need to be changed to capture this. In order to avoid any destabilising impacts a technical management system may not only have to modify regulations and operation procedures with the increase of new risks but also ought to upgrade its evaluation and management functions frequently.

Furthermore, managers' personal knowledge of the cultural context (see top right of diagram) might affect their perception of risk-reporting itself and the demands it has. As I showed, some system users argued that the operating of a technical system squanders the manpower and time of the sub-organisation when dealing with risks. Some were also concerned that the using of a technical management system may unavoidably invade clients' privacy. In order to alleviate such doubts, the modification of a technical system should not only seek to simplify the operating processes and develop more rapid

response procedures but also ought to improve the data security relating to privacy.

Diagram 7.3 The functioning of risk governance in the modification of a socio-technical management system within a cultural context in current risk stage



Post-risk

Finally, in the post-risk stage (that is how lessons are learned from risk events), risk may be classified into two types depending on people's attitude considering risks as certainty or uncertainty (see as Diagram 7.4). As the exploration of the functioning of the CSRS suggests, in a high group/grid organisational culture (see bottom left of diagram), when risks contain high levels of uncertainty the task of risk management is more likely to be focused on the largest number of risks that are likely to cause serious harm to the organisation. Policies are likely to be focused on those risks seen as most significant and predictable such that management are more concerned with controlling such risks than considering risks in general. In addition, the managers may be given greater administrative rights which allowed managers making decision at event scene to handle risks of this type. Also, the highest managers may provide and develop some plausible strategies to deal with risks.

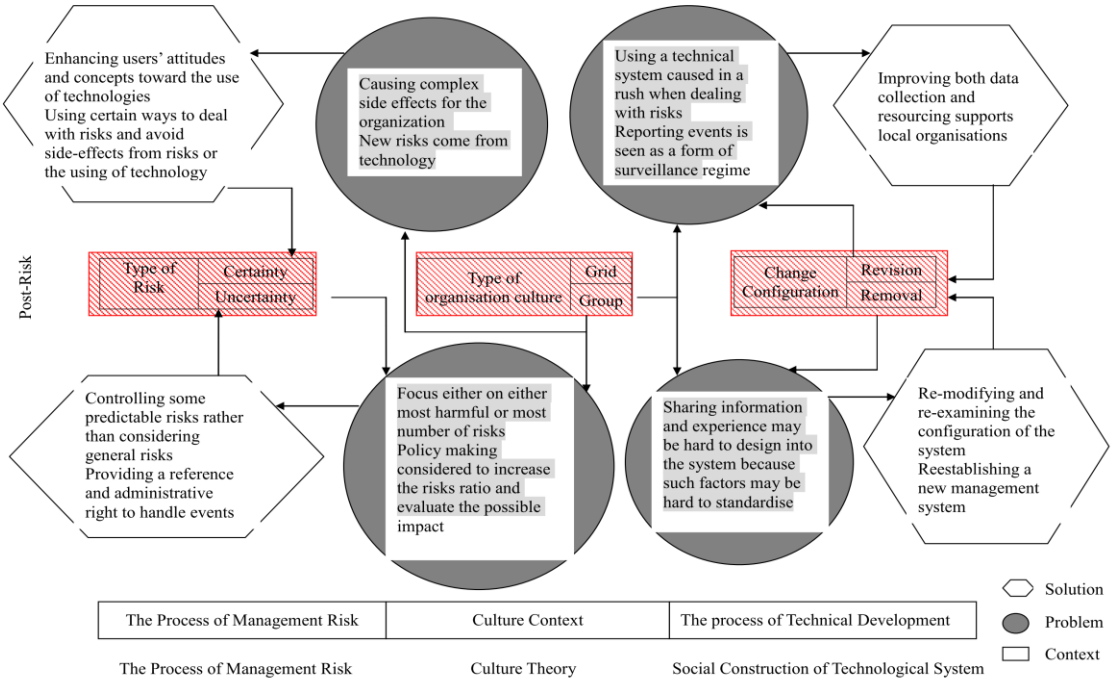
Moreover, sometimes risks may create consequent side-effects for an organisation (see

the top left of diagram); they are not only caused by the using of technology but also may be created by the technology itself. For example, student may record a conflict and post it to YouTube or send to media between staff and student. Such conditions seem to generate more uncertainties about handling risks. Consequently, in order to solve and avoid this, system designers are likely not only to seek to improve the users' attitudes toward the use of the system but also to educate them to deal with risks in a certain way and avoid the creation of new risk in the future. Otherwise, one of the best ways may be considered some long-term plan for managing risks more effectively.

In regard to the operation of a technical system to manage post-risk (see bottom right of diagram), as the diagram shows risk management could be improved by the modification of or change in the configuration of a technical management system which extended the system function be more flexible to cover or handle the increase of diversity events; however, some elements are unable to be easily integrated into the system if they contain many less controllable or contingent processes because technological system do not autonomously acquire the momentum needed to achieved the goals anticipated depending on operator's attitude toward the system function, such as users sharing information or experience. Consequently, in order to address such a problem the senior managers/designers may need to re-modify and re-examine the configuration of the system frequently or re-establish a completely new – and so socially plausible and workable – management system.

Finally, other issues likely to cause concern among operators using the system (see top right of the diagram) include the pace at which reporting has to be done while actually dealing with the scene of the risk-event at the same time. In order to avoid such concerns, the senior management centre may have to improve both data collection and level of resource and support to local or sub-organisational users which given more information and resources for operators to understand or predict many uncertainty condition be certainty when dealing with risk. By doing so, they may not only achieve the acceptability and safety of the system but also cause the system's function to be more valued and acceptable by managers and operators at both the management centre and sub-organisation.

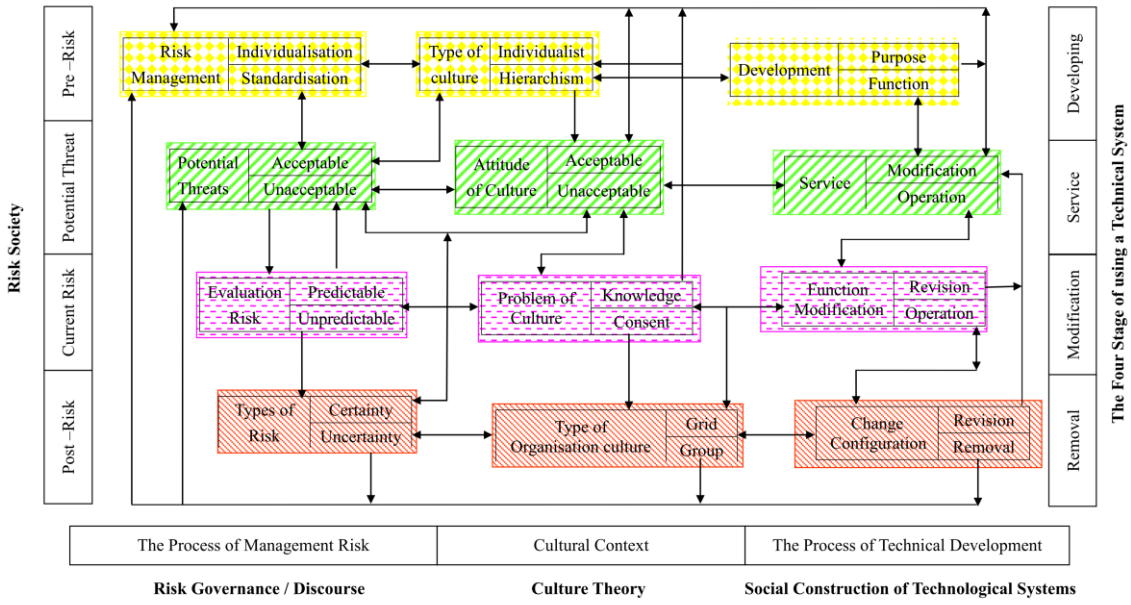
Diagram 7.4 The functioning of risk governance in the change of a socio-technical management system within a cultural context in post-risk stage



Integrating the findings and results of the general account above, the interaction of the functioning of risk governance and the dynamic of developing a socio-technical management system appears to work at a number of different levels where distinct problems and solutions are deployed in respect to the process of management risk, within a specific cultural context and across the four stages described above, this is modelled in Diagram 7.5 below. As the Diagram shows, the four stages of risk are represented on the left side of the diagram, while, their relation to the use of a technical system shown on the right side. The main theoretical issues shaping my thesis appear on the bottom of the diagram – including risk governance, culture theory and SCOT which involved investigating the process of risk management, locating this in its cultural context and the more specific process of the development a technical system (from left to right). Significantly, as the model suggests (see the top row), establishing a standardisation procedure of dealing with risky events to operate a technical management system is likely to provide some effective function to manage and avoid risks because it helps and give a guideline and direction for managers to deal with risks but the tasks of risk management are more complex, and reflect the different characteristics of risks as well as the need to distinguish the potential gaps between an

individualist/local and hierarchical organisational culture. In addition, a technical management system may be unable to handle or control every potential threat in a risk society because the acceptability and unacceptability of potential threats may be different to that presumed by the organisational management framing depending on the attitude of those working within a specific organisational culture (see the second row). Consequently, a socio-technical management system not only has to contain some flexibility and be open to modification but also ought to assess the acceptability of potential threats that are accepted or unaccepted by all those involved. Moreover, when evaluating risks whether predictable or unpredictable, the tasks seem to be influenced by the knowledge and consent of users within the organisation's culture depending on the seriousness of the risks (see the third row); thus, a technical management system may not only have to upgrade the system function but also may change or revise the operational procedures with the increase of unpredictable risks as well. Finally, in managing a post-risk strategy (see the lowest row), a technical management system may have to revise its configuration again and again until it is able to control or handle potential new risks, or if not, be replaced by a completely new management system.

Diagram 7.5 The interaction of the functioning of risk governance and the development of a socio-technical management system within a cultural context



7.5 Limitations of the model

This thesis not only examined the historical record data in the CSRS, the operators' opinions toward the utility of a socio-technical management system but also interviewed managers and staff members of a hierarchical management structure found within the educational regime in Taiwan. Drawing on Douglas, I have argued that the management framing of the CSRS is kind of a high grid/group organisation because it is not only operated by managers from a similar (military) background but also uses a bureaucratic management organisation which may be one of the factors empowering the system's utility to handle risks because of the level of value integration and decision-making this form of grid/group fosters. However, as Douglas also argues, organisations may have their own sub-cultures depending on the targets and goals which those in power expect the organisation to achieve. This partly explains the behaviour of withholding information about events, evidence of the influence of risk management existing at the local level. Consequently, for the model to be valid, it would need to ensure that this issue is properly addressed.

Firstly, examining the historical record data in the CSRS obviously highlights many potential patterns and trends which likely could empower managers' abilities to prevent and predict risks further, such as, according to the particular time, season, weather and city. However, the statistical results seem unable to account and explain the "Dark Figure" of risk information, which ignored the regulation of the system and withhold events by some schools, that is withheld by users in the local school because such events may create potential threats to the organisation.

Secondly, in the quantitative survey the results show that the participants had a similar background with military training which may explain why they accepted to respond and answer my questions, leading to a very high return ratio of the questionnaire. On the one hand, the similar background of participants provided the basis for a significant comparison between staff based on gender, working position, seniority or status. On the other hand, the similarity of the background of the managers and operators in the CSRS may contrast with other hierarchical organisation which may mean that the experiences and results are hard to transfer and generalise to other organisations completely because the managers of the CSRS were come from military background but worked at school which may not find out at other organisation.

Finally, the qualitative survey seems to indicate that a technical management system can be used not only for reporting events but also to gain knowledge and experiential learning, provide opportunities for trend analysis, and so on. However, as I pointed out in the methodology chapter, the CSRS was established by the peculiarities of the educational regime within the Taiwanese government which caused by some potential problems from both national and natural threats so the results may not transfer to other organisations whose cultural characteristics may be different from organisation to organisation, city to city, even country to country. However, the architecture of the model in general could be deployed as a tool in many different setting because it may be found some similar patterns if examines the concept of finding risk within culture and explores the function of dealing with within SCOT context.

7.6 Final comment

The theoretical perspectives discussed earlier in the thesis contained many useful concepts to explore risk management; however, they seem unable to distinguish between different forms of risk or if those risks contained many uncertainties. Therefore, I focused not only on the concept of culture theory to explore the interaction of risk management existing across an organisational culture but also relied on the ideas of the SCOT approach to distinguish some possible phenomena and dynamic of managing daily risks in a hierarchical organisation. Although some limitations may affect the validity of the thesis, some survey results and findings may be worth noting for other researchers who are interested in similar research for academic or policy reasons in developing strategies to manage risks in a risk society. The main areas to focus on are:

- Explore how unpredictable risks are managed
- Examine the ways in which systems are modified in response to changing risk
- Examine the ways in which managers and users interact and how hierarchical and local cultural practices work together or in different directions
- Examine what are seen as hard to control risks and how these are reported
- Examine the play of groups and their interests in shaping the system and how problems are dealt with
- Examine the relationship between leaders/designers and users of the system and how this shapes the acceptability of risk.

To conclude, some recommendations and references in relation to the managing of risk

at the government management level may be worth suggesting and so contributing to the management centre of the CSRC. Begin with the examination of using a socio-technical system to manage risks, while the standardisation of risk governance should be based around efficiency and should treat every managing process and function completely and so establish a standard hierarchical organisation management culture. However, this can be very impersonal and as a result ignore the range of perspectives found in the sub-organisational culture. Indeed, in order to manage, handle and reduce risks the government managers should not only try to improve the operators' confidence toward the using of technological system to manage risks but also have to empower users' abilities in regard to the prevention of risks. Such abilities particularly may focus on the transfer of experiences and knowledge top-down because the management centre controls more resources than the sub-organisation; at the same time, the system designers and senior staff have to understand and consider some potential bottom-up problems which are hidden within the local organisation.

Moreover, the acceptability of potential threats is dependent upon the acceptability of the harm from threats to the organisation and so a system should empower every staff to understand the balance and limitation of threats as objectively as possible between acceptable and unacceptable threats to the hierarchical organisation. As can be seen, in theory, the analysis of the longitudinal data (in Chapter 4) highlights many possible trends and provides useful recommends for preventing risk; however, in practice, the policymaking of *other* government departments may mean that effective use of this information is limited. In addition, in order to operate a socio-technical management system effectively government managers not only have to consider establishing a reporting culture which may be established by sanction or discipline in a hierarchical organisation culture but also ought to consider how to provide benefit and help to encourage the acceptability of such a reporting culture for those in the sub-organisation.

After that, evaluating risk is based on the effective evaluation of every potential threat and seeking to make unpredictable risks more predictable. However, this cannot be done by ignoring the multiple forms of local knowledge and securing consent toward the evaluation of risks existing locally. Nor can it ignore the way in which more prediction can in itself generate new, unforeseen risks. Consequently, the evaluation of risks may be different from government to local school, because each organisation may be more concerned about different impacts or side-effects from risks to the organisation than

understand the causality of risks. As my interviewees suggest, in light of this, the establishing of a reporting culture may have to construct an automatic reporting and operating procedure or algorithm which is as rigorous as possible rather than discipline staff by the use of sanctions or punishment.

Finally, it seems that in order to ensure the effective prevention risks, senior management not only has to analyse the historical data and explore some potential factors which may create risks but also ought to develop some solution functions for the sub-organisation, according to some risk characteristics such as, frequency, geographic areas, culture, society and technology. As my survey results suggest, the CSRC published the annual reports every year; however, many managers were unable or never received it even though the report was posted on the website. Moreover, staff within the education department with the power to make policies seem to ignore the contributions and value of annual reports which meant the report was somewhat ritualistic; as a result, it cannot empower the prevention functions effectively. It seems that management not only have to transfer the results more effectively from government to local organisations but also consider policy making about risk management according to the report.

In my literature chapter, I argued that risks involve and contain different perspectives from the past to present society; its meaning involves both danger and opportunity, for example, in Chinese. I integrated some theories to examine the functioning of a technical management system which handles daily risks in schools and colleges across Taiwan. Indeed, while a technical system improves managers' abilities to handle and manage risk in the first place, new risks will actually accompany the very process of managing, either through the use of technology or from the interaction – the feedback loop – of an organisation's culture and risk itself; as a result, the managing process and so risk governance are made more uncertain. My thesis seems to suggest that if managers ignore the factor of culture to manage risk, even with the help of technology, they may experience the reduplication of risk; therefore, dealing with the process, which assumes it is an opportunity for control, may create new risks for an organisation or manager once again. In order to avoid such unacceptable phenomena when governing risk one of the possible ways may be to rely on the lessons of SCOT as a process that can be actively embraced beyond its purely theoretical contribution; by doing so, this would probably effectively empower the socio-technical system's ability to manage risk in a more socially robust way in risk society.

Appendix I Three levels of campus security events

Level of event Main categories	A Level	B Level	C Level
I. Accident Event	1. An accident causes staff or student near (or certain) death on the campus or out of campus. 2. A group of people (over 3) injured or poisoned sent to the hospital. 3. Mountain climbing accident. 4. A chemical material in a laboratory accident causes people injury. 5. An event may cause mass media attention.	1. An accident caused serious injury for staff or student in the campus or out of campus. 2. A person commits suicide or self harm not immediately danger of life. 3. An accidental event such as slight poisoning or laboratory.	1. An accident causes people slight injury. 2. An event may cause staff or student slight injury. 3. An accident not handled immediately does not cause side-effects.
II. Secure Preserve Event	1. Man-made disaster cause staff or student near (or certain) death on the campus or off campus. 2. An accident causes serious damage for campus facilities or property (over NT1, 000,000). 3. A fire alarm causes injury on the campus. 4. A explosion on the campus. 5. A kidnap/extortion, or violent and brutal event for staff or student. 6. These event may create mass media concern.	1. Man-made disaster causes harm to staff or students in the campus or out of campus. 2. An accident causes serious damage to campus facilities or property (over NT100, 000 to fewer than 1,000,000). 3. A hacker invades the campus computer system.	1. Slight injury of staff. 2. An accident causes slight damage for campus facilities or property (under NT100,000). 3. A dispute dealt with by a school.
III. Violence & Deviant Behaviour	1. Violence or deviant behavior cause staff or student near (or certain) death. 2. Staff or student the violence or deviance behavior cause serious damage for campus facilities or property (over NT1, 000,000). 3. Staff or student to partake in group (over 3 people) crime or cause injured. 4. Staff or student to partake in serious or to offend. 5. Staff or student engage in offenses against sexual autonomy or indecent exposure. 6. The other violence or deviant behavior may cause media concern.	1. Staff or student the violence or deviance behavior cause serious damage for campus facilities or property (over NT100, 000 and under 1,000,000). 2. Staff or student to partake in illegal case and interview by a public procurator. 3. Staff or student sexual assault the other people but did not causes injury.	1. Staff or student violence or deviant behavior cause slight damage of NT100,000). 2. Deviant behavior causes controversy.
IV. Counseling Conflict Event	1. A counseling conflict event cause staff or student near (or certain) death. 2. A serious conflict and against event could to influence the student learning and may cause media or society concerned and disturbed. 3. Some outside force or influence to intervene the student movement or against event. 4. The other counseling conflict event may cause media to concern.	1. A counseling conflict event caused heavy hurt for staff or student. 2. A conflict and against event has to subside would not to influence the student learn and cause society and media concerned.	1. A conflict causes people slight injury. 2. A conflict causes a civil dispute.
V. Illegal Event for Children & Teenager (Under 18)	1. An infringe to incur the student near (or certain) death. 2. A family or crime event could cause psychology trauma for student. 3. The other illegal event for children & teenager may cause media concerned.	1. An event caused heavy hurt for student. 2. A family or crime event.	The other individual event match the low requests should promulgate the social policy agency
VI. Natural Disaster Event	1.A natural disaster (such as strong winds、floods and earthquake) cause staff or student near (or certain) death. 2.An event cause serious damage for campus facilities or property (over NT1, 000,000) need emerge to succor. 3. The other natural disaster event may cause media concerned.	1.A natural disaster (such as strong winds、floods and earthquake) causes harm for staff or student. 2. An event cause serious damage for campus facilities or property (over NT100, 000 and fewer than 1,000,000).	1.A natural disaster (such as strong winds、floods and earthquake) cause slight harm for staff or student. 2. An event cause slight damage for campus facilities for property (under NT100, 000).
VII. Other Campus Event	1. A school administrative event could to influence the student learning and may cause media or society concerned and disturbed. 2. Another event cause staff or student near (or certain) death. 3. Another event may cause media concerned.	1. A school administrative event has to subside would not to influence the student learn and may cause media or society concerned and disturbed. 2. Another event may cause heavy hurt for student and staff.	1. School administrative event has to handle immediately do not cause side-effect. 2. Another event may cause slight hurt for student and staff.
VIII. Disease Event	1. An infectious disease of statutory. 2. Anything may concerned by media.	1. A group of people (over 10) to infect an infectious disease.	Student or staff to infect disease sent to hospital

Appendix II The result of pilot test of the quantitative survey

N=20

		number	%			number	%
A. Rank	lieutenant	0	0	E. Period in Position	Under 1 year	13	0.65
	captain	2	0.10		1 to under 3 years	2	0.10
	major	10	0.50		3 to under 5 years	1	0.05
	Lieutenant colonel	5	0.25		over 5 years	4	0.20
	No response	3	0.15	F. Academic Qualification	University	12	0.60
B. Gender	Male	8	0.40		Master	8	0.40
	Female	6	0.30		PhD	0	0
	No response	6	0.30	G. Military Background	Basic training	1	0.05
C. Position in Department	General staff (under 2 years)	4	0.20		Intermediate commander training	16	0.80
	General staff (over and include 2 year)	7	0.35		Advance commander training	3	0.15
	Supervisor of department	5	0.25		Summit training	0	0
	Head of department	4	0.20				
D. Type of the school	High School	8	0.40				
	Vocational high school	6	0.30				
	Complete school	0	0				
	Liaison office	2	0.10				
	University	4	0.20				

B:Personal experience about the student accident report system.

	Yes (%)	No (%)
f. Do you have any experience of operating any other similar systems?	7(35)	13(65)
g. Did you get any training from school before you first operated this system?	15(75)	5(25)
h. Did you get any information about why the Minister of Education designed this system?	15(75)	5(25)
i. Do you believe the effect of this system is helping schools to manage risk events?	16(80)	4(20)
j. Do you think that schools are responsible to students' personal privacy when an accident happens to them?	18(90)	2(10)
k. Do you think that reporting the accident which happened in schools is one of the ways for the Minister of Education to montor schools?	13(65)	7(35)
l. Did you get any analysis report or result about the student accident event from the Minister of Education?	15(75)	2(25)

C. Personal opinion about the Student Accident Report System

	Strongly agree	agree	Neither	disagree	Strongly disagree
m. This system is useful for schools to manage students' accidents?	2(10)	11(55)	6(30)	1(5)	0
n. This system provides a good communication function in managing risk for education system?	3(15)	11(55)	5(25)	1(5)	0
o. Student security is sometimes more important than study in school?	12(60)	8(40)	0	0	0
p. This system provides useful information for the prevention of risk?	2(10)	16(80)	1(5)	1(5)	0
q. The operating training provides enough knowledge for you to operate this system?	4(20)	13(65)	2(10)	1(5)	0

D. Personal opinion about the organisational culture

	Strongly agree	agree	Neither	disagree	Strongly disagree
r. This system is used for the Minister of Education to monitor schools?	1(5)	4(20)	9(45)	5(25)	1(5)
s. This system may invade students' or staffs' privacy.	0	7(35)	4(20)	8(40)	1(5)
t. The database analysis is a part of the school's obligation to anticipate and prevent other accidents happening to students?	5(25)	12(60)	2(10)	1(5)	0
u. The database analysis is one of the responsibilities of the Minister of Education?	6(30)	10(50)	3(15)	1(5)	0
v. The operating training provides enough knowledge(for you) to operate this system?	5(25)	10(50)	3(15)	2(10)	0

E. Personal experience about the student accident event

According to the experience from the past which event(s) were more common in your school.
(Multi-choice)

Accident Event	19(95)	Illegal Event for Children & Teenager	4(20)
Secure Preserve Event	8(40)	Natural Disaster Event	1(5)
Violence & Deviance Behavior	9(45)	Other Campus Event	1(5)
Counseling & Conflict Event	7(350	Disease Event	11(55)

Appendix III The interview questions with the system operators

A. Personal background

1. Job title and description.
2. Educational background

B. Personal knowledge of background to the system

3. What is the purpose do you think for the Minister of Education to design this system?

Probe for: a. what is the concept come from?

b. do you think the system functions effectively with respect to school management?

C. System operator experience and suggestion

4. Have you had any similar experience elsewhere before operating (managing) this system? If so, Could you describe the experience?
5. Did you take any training before operating (managing) this system?
6. Do you find any problems when operating this system?
7. Do you have any suggestions about this system for the system manager ?

D. Personal opinion towards the System's function for the organisation

8. Do you think this system helps organizations with risk management?
9. How does it provide the function for risk management?
10. What is your opinion of the data management of campus accident events by the Ministry of Education for long-term risk surveillance?

E. Use of information from the system for organisation

11. Did your school (or department) analyse the historical record of accident reporting from the system database?

    Probe for: a. what is the purpose?

    b. how do you use the analysis result?

    c. what is the effect of using this result?

12. Do you know that the Ministry of Education analyses the database from this system each year?

    Probe for: a. If so, do you think what is the function of the analysis report could provide for risk management at school?

13. Do you think the analysis document is useful for preventing student accidents?

    Probe for: a. how does it happen?

    b. can you provide any examples?

F. Personal opinion towards the other potential problems in system

14. Do you think one of the functions of this system is the surveillance to schools for the Ministry of Education?
15. Do you think reporting the campus security event may invade personal privacy?
    Probe for: How do you think to avoid it?

G. Personal opinion toward the procedure of campus security events and the right of client

16. Do you think the system will change the reporting regulations because of the concern in some events from media? What do you think?
17. Do you think schools should notify the client the event will be sent to the Campus Security Centre when dealing with the event? Why?
18. Do you think schools should notify the clients' legal guidance immediately when dealing with the event? If so, why?

H. Personal experience of dealing with campus accident event

19. Have you ever been required to temporarily keep secret for any events to protect the reputation of a school? If so, what were these events and what did you do? Was this information ever made public later on?
20. Do you think reporting campus security events may generate hostility towards you from your colleagues who might regard you as working too closely with senior management?
21. According to personal experience, what kinds of event do you think are sporadic events and hard to control? How do you think this condition could be improved?
22. According to personal experience, what kinds of event do you think are happening with frequency and why are they hard to reduce?

    How do you think this condition could be improved?
23. According to personal experience, what kinds of event do you think are latent ones and hard to predict? How do you think this condition could be improved?

I. The other

24. In a technological society, schools rely on technology to help with campus security management; however, sometimes students also use technology to cause some events for campus management, for instance: recording counseling conflict events with mobile phone, posting an undue behavioral video on internet or recklessly send an e-mail to the minster of the Ministry of Education etc.
    What is your opinion on this phenomenon?

Appendix IV The interview questions with the system designer/manager

A. Personal background

1. Job title and description.
2. Educational background

B. Designed concept and operator system from personal point of view

3. What is the major purpose of design (manage) this system?
4. Did you have any similar experience before designing the campus accident report system?

   Probe for: a. how does this system work and what is its overall objective or aim?

   b. can you provide any examples?
5. Has the system had to be modified after it has been in use for a few years?

   Probe for: a. why was it changed?

   b. what impacts have such changes had?

C. The function of risk management for organization from designer point of view

6. What function do you think the system serves for the risk management of the organization?
7. What kinds of help in risk management has it provided for policy-making?

D. Training and education for system operator

8. What kinds of the training the manager has provided for operators?
9. How do managers examine the local operators' ability in use of this system to confirm the system provided it function?
10. Do you provide any suggestion for school to make the campus security plan according to the issue of 'how to use the campus security management system to improve the risk management'?

E. Management and effect of system database

11. How does your department management use the database from every school?
12. What are the actual and anticipative effects?
13. What are the causes, if there are any gaps of the anticipation? What is the remedy plan?

F. Manage the Campus security event from manager level point of view

14. Do you think one of the functions of this system is the surveillance to schools for the Ministry of Education? Have any schools reflected this question?
15. Do you think reporting the campus security event may invade personal privacy? How do you think to avoid it?

16. Do you think schools should notify the client the event will be sent to the Campus Security Centre when dealing with the event? Why?
17. Have you ever changed any reporting regulations or policies for some special events?

    Probe for: a. how did you change it?

    b. can you provide any examples?

18. What sort of common events would you regard as acceptable, or to be tolerated without the need for any significant action on the part of the management in the school?
18. If common accident events increase in frequency, do they then get redefined as being more serious?
19. According to personal experience, what kinds of event do you think are sporadic events and hard to control? How do you think this condition could be improved?
20. According to personal experience, what kinds of event do you think are happened with frequency are hard to reduce? How do you think this condition could be improved?
21. According to personal experience, what kinds of event do you think are latent ones and hard to predict? How do you think this condition could be improved?
22. From a manager's point of view, what kinds of event may cause serious problems for risk management? What may be the reason?
23. From a policy management point of view, what kinds of event may cause real policy change?

I. The other

24. In a technological society, schools rely on technology to help with campus security management; however, sometimes students also use technology to cause some events for campus management, for instance: recording counseling conflict events with mobile phone, posting an undue behavioral video on internet or recklessly send an e-mail to the minister of the Ministry of Education etc.

    What is your opinion on this phenomenon?

Appendix V The questionnaire used for the quantitative survey

Thank you for accepting to participate in our questionnaire survey. I am a PhD student at the University of York. The purpose of this survey is to try to investigate the function of the Student Accident Report System which was designed by the Minister of Education. All the data will only be used in the analysis of the research so any personal information will be kept confidentially and anonymised in any published document. This research has been approved by the Department of Military Training Education. If you have any queries about the questionnaire, please send them to e-mail:bh528@york.ac.uk. Please return it before 16th September.
Thank you for your help.

PhD student Bao-chuang Huang
Supervisor Prof. Andrew Webster
Department of Sociology, University of York

A: Personal information

1. Rank:

   ☐1. Lieutenant ☐2. Captain

   ☐3. Major ☐4. Lieutenant Colonel
2. Gender:

   ☐1. Male ☐2. Female
3. Position in Department:

   ☐1. General staff (under 2 years) ☐2. General staff (over and include 2 years)

   ☐3. Supervisor of department ☐4. Head of department
4. Your work Place (Type of School):

   ☐1. High School ☐2. Vocational High School

   ☐3. Complete School ☐4. Liaison Office
5. The period of time you have been working for the Military Training Officer:

   ☐1. Under 2 years ☐2. 2 to under 5 years

   ☐3. 5 to under 10 years ☐4. over 10 years
6. The period of time you have been working in this school:

   ☐1. Under 2 years ☐2. 2 to under 5 years

   ☐3. 5 to under 10 years ☐4. over 10 years
7. Academic Qualification:

   ☐1. University/college ☐2. Master

   ☐3. PhD
8. Military training background:

   ☐1. Basic training ☐2. Intermediate commander training

   ☐3. Advance commander training ☐4. Summit training

9. Is campus security one of your currently job at school.

☐1. Yes ☐2. No

B: Personal experience about the campus security report system

10. Have you have any experience of operating any other similar systems elsewhere before operating this system? If yes, please answer question 11; if no, please move on to question 12.	☐ Yes ☐ No
11. Was that similar security report system used in the military?	☐ Yes ☐ No
12. Did you get any training from school before you first operated this system?	☐ Yes ☐ No
13. Did you get any information about why the Minister of Education designed this system?	☐ Yes ☐ No
14. Did you get any analysis report or result about 'campus accident event' from the Minister of Education?	☐ Yes ☐ No

C. Personal opinion about the Campus security Report System

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
15. The reporting procedures are simple and easy to operate?	☐	☐	☐	☐	☐
16. This system is effective for schools to manage risk events.	☐	☐	☐	☐	☐
17. This system provides a good communication channel in managing risk for the education system.	☐	☐	☐	☐	☐
18. In some situations, such as risk to personal health/injury, student security is more important than study at school.	☐	☐	☐	☐	☐
19. The operating training provides enough knowledge for you to operate this system.	☐	☐	☐	☐	☐
20. The classification of the event by the system is clear and includes every event.	☐	☐	☐	☐	☐
21. The system may change the regulations because of the interest in some events from media. (for example, upgrade the event level)	☐	☐	☐	☐	☐

D. Personal opinion about the organisational management culture

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree

22. A school has an obligation to deal with any events which happen to students and staff.	☐	☐	☐	☐	☐
23. A school has an obligation to protect personal privacy when accidents happen to students or staff.	☐	☐	☐	☐	☐
24. This system may invade students' or staff's privacy when transferring personal information.	☐	☐	☐	☐	☐
25. Asking a school to report an accident is one of the functions of surveillance for the Minister of Education to monitor schools.	☐	☐	☐	☐	☐
26. It is a school's obligation to anticipate and prevent other accidents with the help of historical database analysis.	☐	☐	☐	☐	☐
27. It is an obligation of the Minister of Education to analyze the historical database.	☐	☐	☐	☐	☐
28. Sharing information about campus security events which happen at other schools could help a school prevent similar events.	☐	☐	☐	☐	☐
29. To protect the reputation of a school, sometimes the administrative manager may temporarily withhold information about specific events.	☐	☐	☐	☐	☐
30. Reporting school accident events may make colleagues hostile towards you because this may be seen as being too ready to please management.	☐	☐	☐	☐	☐

E. Personal experience about the campus security event

	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
31. Accident events usually happen to particular types or groups of student.	☐	☐	☐	☐	☐
32. Schools should notify the client that the event will be sent to the Campus Security Centre when dealing with the	☐	☐	☐	☐	☐

event.					
33. Schools should notify the clients' about any legal guidance immediately when dealing with the event	☐	☐	☐	☐	☐
34. Client and his/her legal guardians have the right to know how a school reports the event.	☐	☐	☐	☐	☐
35. Sporadic events which involve multiple-factors such as 'food poisoning' are hard to control.	☐	☐	☐	☐	☐
36. Some events happen with high frequency such as 'car accidents', so they are hard to reduce.	☐	☐	☐	☐	☐
37Latent events such as 'suicide' are hard to anticipate and to manage.	☐	☐	☐	☐	☐
38. While technology may help with risk event management, sometimes it also causes some new problems, for instance: recording counseling conflict events with mobile phone, posting an undue behavioral video on internet or sending an e-mail to the minister of the Ministry of Education etc.	☐	☐	☐	☐	☐

39. According to your experience from the past, which event(s) were more common in your school? (Multi-choice)

☐ Accident Event	☐ Counseling & Conflict Event	☐ Other Campus Event
☐ Secure Preserve Event	☐ Illegal Event for Children & Teenager	☐ Disease Event
☐ Violence & Deviance Behavior	☐ Natural Disaster Event	☐

40. According to the pilot test of this survey, both accidents and natural disasters are more common. Is this situation similar to your personal experience in the past? If so, could you explain the reason? If not, according to your experience, what kind of the event may be more common at your school and why?

I would like to do some follow-up interviews: can you indicate whether you would be available to do this, and if you would like to accept the interview please e-mail me independently of the survey.

Appendix VI The official document approving the research from the Ministry of Education Department

檔　　號：
保存年限：

教育部　函

機關地址：臺北市中山南路5號
傳真：02-33437920
聯絡人：符興民
聯絡電話：02-77367914

受文者：英國約克大學社會學黃寶中先生

發文日期：中華民國98年2月5日
發文字號：台軍(二)字第0980017228號
速別：最速件
密等及解密條件或保密期限：普通
附件：

主旨：茲同意台端以我國各級學校校園危機事件分析為題，進行研究計畫，如說明，請 查照。

說明：

一、本部同意提供校安中心近5年（僅提供92至96年）相關通報資料，以利遂行「台灣校園危安事件趨勢與對策－以近五年教育部通報事件為例」研究計畫。

二、俟研究計畫完成後，請將研究成果提供本部參考。

三、有關本部校安中心近5年相關通報資料之取得，請逕向承辦人員接洽。

正本：國立勤益科技大學軍訓室趙申主任、英國約克大學社會學黃寶中先生（趙申主任轉交）
副本：國立勤益科技大學、本部軍訓處

裝 訂 線

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國立勤益科技大學
0980050669 09/02/05

Appendix VII The interview consent from

INTERVIEW CONSENT FORM

My name is Bao Chuang Huang

I am doing research on a project entitled:

Risk governance: the management of socio-technological risk in the different cultures and contexts

My tutor/supervisor Prof. Andrew Webster is directing the project and can be contacted at:

Department of Sociology
Wentworth College
University of York
Heslington
YORK
YO10 5DD

Tel: (0)1904 434740

Thank you for agreeing to take part in this project. Before we start, I would like to emphasise that:

- Your participation is entirely voluntary
- You are free to refuse to answer any question
- You are free to withdraw at any time

The interview will be tape-recorded, but the data will be kept strictly confidential and will be available only to members of the research team. Excerpts from the results may be made part of the final research report, but under no circumstances will your name or any identifying characteristics be included in the report.

Please sign this form to show that I have read the contents to you.

(signed)

(printed)

(date)

Appendix VIII The main and sub-categories of the campus security event in 2008

I. Accident Event	II. Security-related Event	III. Violence & Deviant Behavior	IV. Counseling Conflict Event	V. Illegal Event involving Children & Teenagers (Under 18)	VI. Natural Disasters	VII. Other Campus Event	VIII. Disease
1. Traffic accident on the campus. 2. Traffic accident outside of campus teaching. 3. Traffic accident out of campus. 4.Drowning 5. Poisoning. 6.Injury from sport or general horseplay 7. Fall from building (not suicide). 8. Mountain accident. 9.Injury received during laboratory or practical training 10.A suicide or self-harm event 11Injury from re-establishment. 12. Injury by building collapse. 13.Other accident event 14. Injury from part-time work place. 15. Other material causes of poisoning. 16 Chemical material in laboratory causing poisoning 17. Suicide with child 18. Student suicide or self-harm 19. Staff suicide or self-harm	1. A fire on campus. 2. A fire outside of campus. 3. Facilities destroyed by someone on campus. 4. An explode event on the campus. 5. A dispute event from rant house. 6. A dispute event from bargains. 7. People from outside to pose risk to teachers and students. 8. Campus facilities or equipment lost through theft. 9. The property loss by theft. 10. Swindling 11. Injury 12. Robbery 13. A threaten and extort event. 14. Suspect be kidnap 15. The other violent event. 16. Sexual assault or obscene behaviour (over 18). 17. Sexual harassment (over 18). 18.Other campus security-related event 19 A dispute event from internet 20 A hacker attack on the network system 21 Staff swindle through the network	1. Student to fight with weapons between groups of people. 2. A faction to have a fight. 3. Normal fighting event. 4. Suspect involved in killer event. 5. Suspect involved in robber event. 6. Suspect involved in threaten event. 7. Suspect involved in kidnap event. 8. Suspect involved in steal event. 9. Suspect involved in gamble event. 10. Suspect l involved in sexual assault or indecent attitude event. 11. Suspect involved to sex harassment event. 12. Suspect involved to illegal to possess firearms. 13. Suspect involved to against the drugs prevention and cure low. 14. Suspect involved to hinder the Low 、 order and official business. 15 The other violence & deviance behavior in the campus. 16 Suspect involved to arson and to destroy 17 Illegal car racing 18 The other illegal event. 19 Run-away from home and did not go to school (under senior high school). 20 A faction to intervene the campus. 21 Suspect to do sex business. 22 Student to harass the ceremony event. 23 A swindle event from internet 24 A hacker to invade the network system. 25 Suspect involved in hinder families. 26 Student to harass the teaching. 27 Group of students to cheat.	1. A conflict event between student and teacher. 2. A conflict event between parent and teacher (staff). 3. A punishment or abuse event. 4. A resist event from student. 5. A conflict event between student and staff. 6. A conflict event between parent and staff. 7. The other related conflict event.	1. Student to drift. 2. Student in to the illegitimate place. 3. Run-away from home in three days. 4. Protect client from illegal event for children & teenager. 5 An abandonment case. 6 The other children and teenager protect case. 7 Adult to compel children or teenager to marry. 8 Illegal to utilize children or teenager. 9 Kidnap or sell children or teenager. 10 To force children or teenager sexual assault or indecent attitude. 11 To use harmful drug or illegal medical for children and teenager 12 Children and teenager suspect involved the sex business. 13 An abuse event 14 The other against Child and Youth Sexual Transaction Prevention Act 15 Sexual assault or obscene (under 18) 16 Sex harassment (under 18) 17 To take or provide noxious tapes or books for children and teenager. 18 Sexual assault causes pregnancy (under 18). 19 High risk family	1. Windstorm disaster 2. floods 3. earthquake 4. Landslip and mudflows 5. To be struck by lightning. 6. Solenopsis ivicta Buren. 7. The other disaster.	1. A conflict even between staff and staff. 2. A problem of general. administration 3. A problem of personnel matters. 4. A problem of administration. 5. A problem of educational administration. 6. The other problem.	1. A generally disease event 2. Statutory disease (Swinepox) 3. Statutory disease (Scarlet fever) 4. Statutory disease (Dengue fever) 5. Statutory disease (Tuberculosis) 6. Statutory disease (Enterovirus) 7 Statutory disease (Pertussis) 8 Statutory disease (the other) 9 Statutory disease (SARS) 10 Statutory disease (Swine flu cause severe illness) 11 Statutory disease (flu cause severe illness) 12. A generally disease (flu) 13. A generally disease (H1N1)

Appendix IX The main and sub-categories of the campus security event in 2010

I. Accident Event	II. Security-related Event	III. Violence & Deviant Behavior	IV. Counseling Conflict Event	V. Illegal Event involving Children & Teenagers (Under 18)	VI. Natural Disasters	VII. Other Campus Event	VIII. Disease
(Traffic accident) 1. Traffic accident in the campus. 2. Traffic accident of out of campus teaching. 3. Traffic accident out of campus. **(Poisoning)** 4. Food poisoning. 5. Poisoning in the laboratory. 6. Other poisoning. **(Suicide or self-harm)** 7. Suicide with child. 8. Student suicide or self-harm. 9. Staff suicide or self-harm. **(Sport or leisure-related event)** 10. Drowning 11. Injury from sport or general horseplay. 12. Fall from building (non suicide). 13. Mountain accident. **(Laboratory, practical training and environmental facility event)** 14. Injured received during laboratory or practical training. 15. Injury from re-establishment. 16. Injury by building collapse. 17. Injury from part-time work place. **Other accident event** 18. Other accident event.	**(Fire event)** 1. A fire on campus. 2. A fire outside of campus **(Artificial disturb event)** 4. Campus facilities or equipment to suffer loss **(Stealing the theft)** 5. Campus facilities or equipment lost through theft. 6. The property loss by theft. **(A dispute event)** 7. A dispute event from rant house. 8. A dispute event from bargains. 9. A dispute event from internet. **(Staff or student attacked by outsider** 10. Injury 11. Robbery 12. Extortion 13. Kidnapping 14. Other violent event. 15. People from outsider to pose risk to teacher and student. **(Information security event)** **16.** A hacker attack on the network system. **A swindle event** 17. A swindle event. 18. Staff swindle by the network. **Other campus security event** 19. The other campus safety protect event. **A sexual assault event (over 18)** 20. A sexual assault event regarded to enforcement rules of the Gender Equality in Employment Act. 21 A sexual assault event not regarded to enforcement rules of the Gender Equality in Employment Act. **A sex harassment event** 22. A sexual harassment event regarded to enforcement rules of the Gender Equality in Employment Act. 23. A sexual harassment event not regarded to enforcement rules of the Gender Equality in Employment Act.	**(Violence & Deviance Behavior)** 1. Student to fight with weapons between groups of people. 2. A faction to have a fight. 3. Normal fighting event. 4. Illegal car racing. 5. Suspect involved in sex business. **(Suspect involved in illegal event)** 6. Suspect involved in killer event. 7. Suspect involved in robber event. 8. Suspect involved in threaten event. 9. Suspect involved in kidnap event. 10. Suspect involved in steal event. 11. Suspect involved in gamble event. 12. Suspect involved to illegal to possess firearms. 13. Suspect involved to hinder the Low 、order and official business. 14. Suspect involved in hinder families. 15. Suspect involved to arson and to destroy. 16. A swindle event from internet. 17. The other illegal event. **(Illegal used Drugs)** 18. Suspect involved to against the drugs prevention and cure low. **(The harass of campus security and administration event)** 19. Student to harass the ceremony event. 20. Student to harass the teaching. 21. Hack or destroy the school information system. 22. Group of students to cheat. 23. Run-away from home and did not go to school (under senior high school). **(Bullying event)** 24. Body bullying. 25. Relationship bullying. 26. Internet bullying. 27. Language bullying. 28. Counterattacking bullying. **(The other Violence & Deviance Behavior)** 29. The other violence & deviance behavior in the campus. 30. Gangster intervene the campus.	**(A conflict between teacher and student)** 1. A conflict event between student and teacher. 2. A conflict event between parent and teacher (staff). 3. A punishment or abuse event. 4. A resist event from student. **(A conflict event in the administrational management)** 5. A conflict event between student and staff. 6. A conflict event between parent and staff. **(The other counseling conflict Event)** 7. The other counseling conflict Event	**The statutory event for children and teenage** 1. An abuse event. 2. An abandonment case. 3. Deprive the educational freedom from children or teenager. 4. The other harm event to children. 5. Children may explore in danger condition. 6. Working in illegal shop. **A sexual assault event** 7. A sexual assault event regarded to enforcement rules of the Gender Equality in Employment Act. 8 A sexual assault event not regarded to enforcement rules of the Gender Equality in Employment Act. **A sex harassment event** 9. A sexual harassment event regarded to enforcement rules of the Gender Equality in Employment Act. 10. A sexual harassment event not regarded to enforcement rules of the Gender Equality in Employment Act. **Suspect involved in the sex business** 11. An event against the Children and Teenage Prostitution Prevention Statute. High risk family 12. High risk family. **Illegal used drug** 13. An event regarded the drug or medication protect act. **The other children and teenager protect case** 14. Student to drift. 15. Student in to the illegitimate place. 16. Run-away from home in three days. 17. The other children and teenager protect case.	**General natural disaster** 1. Windstorm disaster 2. floods 3. earthquake 4. Landslip and mudflows 5. To be struck by lightning. **Environmental disaster** 6. Solenopsis ivicta Buren. **The other disaster** 7. The other disaster.	**An administrative event** 1. A conflict even between staff and staff. 2. A problem of general. administration 3. A problem of personnel matters. 4. A problem of administration. 5. A problem of educational administration. **The other problem.** 6. The other problem.	**eneral disease event** 1. A generally disease event 2. Ophthalmia 3. Influenza 4. A generally disease (H1N1). **The statutory disease** 5. Enterovirus 6. Tuberculosis 7. Scarlet fever 8. Pertussis 9. Swinepox 10. Dengue fever 11. SARS 12. A concurrent disease from statutory. 13. The other statutory disease

Appendix X The translation of interview response with the manager of the CSRS

Respondent: Head of city manager

A. Personal background

1. Job title and description (personal job experience)
2. Educational background

A. My name is XXX. I have been servicing at the Military Officer since 1997. I was at a senior high school as a military officer for one year, as a supervisor for two years and head of the department for three years. Then I serviced at the Ministry of Education office for one year and three months, and was transferred to Taitung City to be the head of the Liaison Office of Taitung City for two years and nine months; after that, I have been the head of Liaison Office of Taichung City since 16th August 2007.

Can you describe the detail of your current work?

A. The apartment I service is the Liaison Office of Taichung City, managed by the Ministry of Education, also known as "Counseling and Guidance Committee of Student Life outside the Campus in Taichung City". There are two majority works for us. The Liaison Office manages are responsible for providing training courses, including personal, educational and logistical courses, for military staff serving at the high schools in Taichung City. Another main work which contains the management of all schools, from primary schools to high schools, is the responsibility of the "Taichung City Counseling and Guidance Committee of Student Life outside the Campus". And in this few years, there are some extensions to this part of work – including the promotion of 'National Defense Education', and the management and counseling for the staff of "Existing alternative Education". The work mainly focuses on the high schools, and assists the management of the primary and secondary schools in Taichung City.

2. Educational background

A. I was a reserve officer graduating in 1984, and ever did a research in the Fu Hsing Kang College in 1997. The background of my regular education was 'Institute of Public Affairs Regional Policy Course' in National University of Taitung.

B. Personal knowledge of background to the system

3. What is the purpose do you think for the Minister of Education to design this system?

A1.Personally, I think one of the functions of the system is to report events to the CSRC immediately. As we know that schools are located in different cities/counties over the country. In order to control the safety condition of students in different areas, it is very urgent for educational managers to establish a management system to help understand what events happened to students, where they happened, what side-effects may be caused and how schools dealt with them. With the help of the reporting system, the chief of the highest educational institution can receive the latest information and gives some guides or supports to local schools immediately.

Probe for: a. what is the concept from?

A1. I think the concept of system may be from the military, because most of the military staff comes from military. This system (CSRS) may be the extension of reporting system and spirit from the intelligence and information system of war in the military to schools

b. do you think the system functions effectively with respect to school management?

A1. I think the system may say that firstly, it provides the condition of problem of campus event at school which can be classified as risk management. In fact, the detail of event has described on the report clearly, some events can be the reference cases for school and it provided some experience for pass events such as fire, traffic accident event, earthquake, or other serious campus events. Because of the dealing function of every administrative staff is different from person to person, through the system can provide some experience for staff who is working at the educational administrative institution without experiences to deal with event. I think that it is a good function for them.

C. System operator experience and suggestion

4. Have you had any similar experience elsewhere before operating (managing) this system? If so, Could you describe the experience?

A1. Before servicing at the educational department, I had no experience of operating the system. But I've got experience of operating similar reporting system in the military. I felt that they are similar.

5. Did you take any training before operating (managing) this system?

A1. We (city manager centre) provide a basic course including training and demonstration of the system for new staff when they report for duty. We also arrange regular training course about operating the campus security reporting system for our staff once or twice a year.

6. Do you find any problems when operating this system?

Probe: is it easy for you to classify events according to the categories in the system?

Probe: any new categories for new types of risk?

A1. From the operator point of view, the system and hardware are ok. The problem is sometime schools' president may withhold or refuse to report the events that may influence the reputation of schools or cause secondary injury to clients/schools. Dealing with such a situation, we will instruct the military officer to report the condition by telephone, a kind of verbal mode.

7. Do you have any suggestions about this system for the system manager (at higher level)?

A1. To simplify the procedure is the most important. According to the reporting procedure, reporters will get a number as a code of the event when they report the event through the CSRS. And they should use the code to input the following information, which is the most frequent mistake in the following reporting procedure. The code is easy to be ignored, which result in the mistake that the following report becomes a new event in the system. However, reporters cannot delete the record because they are not allowed to cancel any information at their managing level. Therefore, the same case may be regarded as two events in the system. Of course, such situation may be improved with enhancement of the training and operation for operators. Otherwise, such phenomena have improved a lot now. Originally, staff has to report the event with complete and correct information, which takes a lot of time and may result in loss of opportune moment. The reporting procedure has been slightly improved. Managers can report the event first and describe the detail later.

D. Personal opinion towards the System's function for the organisation

8. Do you think this system helps organizations with risk management?

8a) Are there other types of risk that are present in the school which are not covered by the categories available to you? If so, what are these other risks?

A1. I believe that the system absolutely provides a function for risk management to organization has some practical significance.. Events may have some side-effects or consequent problem which is not the responsibility of schools. Therefore, the system help transmit correct information for higher level of management authority to make correct decision or provide resource to deal with event actually. It also help administrative agency reply to the Representative interrogation. Without

immediate report, we may lose the timing to deal some time-sensitive events, and make them worse.

9. How does it provide the function for risk management?

A1. It can be said that the system can timely provide information about the school that the event happened in. For example, gas pipes were broken during the regular maintenance of road around a primary school, and the spreading gas made some students feel dizzy even vomit. After receiving the report, the Ministry of Education (Campus Security Report Center) assigned the military staff from school which is near the scene of event to coordinate other governmental agencies to deal with this event together. So it provides information for the Ministry of Education to coordinate related resources to deal with the event.

10. What is your opinion of the data management of campus accident events by the Ministry of Education for long-term risk surveillance?

A1. Actually, I think that I will give a positive attitude to support the system function in reporting events. A persecution is about the reputation of school. In fact, such problem has been reduced by keeping communicating with schools, because the system indeed provide positive help to the whole education institutions.

E. Use of information from the system for organisation

11. Did your school (or department) analyse the historical record of accident reporting from the system database?

Probe for:

a. if so, what is the purpose?

A1. Yes, we do both monthly analysis and yearly analysis. The former produce an analytical table with all the events happened within this month and their percentages. After finishing the analysis, we share the result with schools with our recommend and suggestions as reference. The latter is done at the end of the year. It includes the frequent events in each month; for example, more traffic accidents and drowning events happen in July and August. And the analyses results will be provided to schools as reference for making precaution plan. Most students tend to stay outside longer during summer vacation; therefore, the target of “Counseling and Guidance Committee of Student Life outside the Campus in Taichung City” will focus on outdoor activities. For example, in order to reduce the accident events, we have a special scheme called “Youth Project” in the summer holiday to enhance the patrol outside the campus such as dangerous water areas.

How did you think about the effective of the information?

School will pay more attention on the prevention work when we provide the information to them. Most of student will stay outside longer especially on the summer holiday; therefore, managers will focus the points on outdoor activities. For example, we have a special effort called “Youth Project” in the summer holiday, the project especially enhanced the patrol on the outside of campus such as examined the dangerous areas of water which may reduce the accident events.

c. what is the effect of using this result?

The analysis data have improved the function for managing and preventing events.

12. Do you know that the Ministry of Education analyses the database from this system each year?

A1. Yes I know.

Probe for: a. If so, what the function does the analysis result provide for risk management to schools?

A1. The data can be used as reference for making plans (of campus security). Actually, most schools may not get the ability to analyze the data but they do know the peak period of each problem. According to the analysis by the Minister of Education, they may know that conflicts between students and teachers frequently happen at the beginning of new semester. Some schools caring about it may take some preventive measures while some may just ignore it. It depends on the characteristics of schools.

13. Do you think the analysis document is useful for preventing campus security events?

Probe for: a. how does it happen?

b. can you provide any examples?

A1. For example, more conflicts between teachers and students happen in every September due to the hair issue. Although the hair restriction has been abolished by the Ministry of Education, the discipline of hair is still demanded by some private school managers. Actually, we have explained the policies of hair issue and communicated with school managers in the conference at the end of August or the beginning of September. Otherwise, we will focus on particular problems according to the analysis result of system data. For instance, according to the analysis data, during the graduation season, from May to June, some students are

easy to get impetuous. Therefore, we have reminded the school staff to enhance the emotional management, which could help reduce conflicts between the staff and students.

So, you think that the system not only provide the prevention of event for manager but also reference for the psychological preparation.

Psychological construction of student events for the staff may keep them from being influenced by the students' emotion.

F. Personal opinion towards the other potential problems in system

14. Do you think one of the functions of this system is the surveillance to schools for the Ministry of Education?

A1. Personally, I do not think the surveillance to school is the main purpose of this system, but it doesn't seem that we could exclude the function of surveillance. The major purpose of using of the system for the Ministry of Education is to control situation and correct information for providing recourses and helping deal with the problem for schools. Nowadays, it is a democracy society; in fact, all the systems in schools are normalized and legalized. No one can change or control it by surveillance. The point is focused on how to get the correct information, what appropriate assistance should be provided and whether schools deal with the events. Besides, the community is concerned about whether educational authority take any actions to deal with even to prevent the events happened to students. For educational authority, how schools deal with the events and what assistance it can provide is more important.

15. Do you think reporting the campus security event may invade personal privacy?

Probe for: How do you think to avoid it?

A1. We have concerned about the issue all the time. We replace the t real name of client with code or number or just his/her family name in the report of events relating to particular cases such as sexual assault, harassment and venereal disease events or events which could cause secondary injury to client. This is a consensus concept over the system managers. With regard to the general campus events which may not cause significant impact on the client, sometime the name of the client is already shown and published on the media. The whole system has enhanced the protection of client.

G. Personal opinion toward the procedure of campus security events and the right of client

16. Do you think the system will change the reporting regulations because of the concern in some events from media? What is your opinion on this situation?

A1. Yes. Generally speaking, there are three levels of categories in the CSRS. Events classified into A level are heavy casualties and should be reported to the CSRC within fifteen minutes. Events of B level belong to the middle level of accidents; some of them are inter school. General events such as falling injury belong to C level. However, the level of events might be upgraded once reported by the media. So the concert from media will change the reporting procedure of the system.

17. Do you think schools should notify the client that the event will be sent to the Campus Security Centre when dealing with the event? Why?

A1. Normally, we may not notice the client that the event has reported to the Campus security centre and simply follow the reporting procedure in administration system without the permission of the client of their parents. Whether the client and their parents should be notified before the event is reported is different from person to person. After events happened, the Minister of the Education hope to help deal with the event by controlling related information and providing appropriate assistance. It may be necessary to notify the client and their parents in a democracy society, but there might be some problems in administrative management if the client's parents don't agree with the reporting of event. So it needs more discussion on this issue.

18. Do you think schools should notify the client's legal guidance when dealing with the event? If so, why?

A1. I think it is a good thing to notify the client. But I think that most schools simply follow the administrational procedure to report the event and do what they should do to deal with the event under the guidance of regulation; therefore, schools will contact the clients and their parents but not necessarily notify them about the reporting of the event, because the event already happened. The dealing with event and controlling the follow condition are more important than the notifying of the client. Of course, actually as we know that school will contact the student legal guidance or the client. Therefore, school just follows the administrative process to operate the event which illustrate and report according to the regulation of administrative system. So, I do not think it is urgent to notify the client or their

legal guidance about everything since dealing with the event is the most important at the moment.

H. Personal experience of dealing with campus accident event

19. Have you ever been required to temporarily withhold any events to protect the reputation of a school? If so, what were these events and what did you do? Was this information ever made public later on?

A1. Yes, the first thing school ask to withhold is the problem between teachers and students; the second is the event which may influence the reputation of schools; and the third is sexual assault or sexual harassment. Especially about the problems between teachers and students, schools always ask for complete investigation before they are reported. In fact, it may delay the timing of reporting event. – These reputational issues (the first two especially) seem to me to pose a challenge to the hierarchical grid/group character of the college security system/college organization precisely because they imply that the college system is weak/lacks discipline. This may partly explain the desire to keep this hidden as much as possible

What did you do when schools ask you to withhold from reporting?

A1. Liaison office (City management centre) and the school staff reach an agreement that when dealing with such events, the school staff will report the event by telephone. At least high level managers know that there is such an event. Even some parents ask for withholding sexual assault or sexual harassment events. After the event has been investigated completely, we will suggest that school finish the report procedure.

So, event still will be reported when the investigation finished.

Yes, event will be report eventually. We have a consensus of reporting such events by phone. For example, in a physical examination, AIDS positivity was observed in the result of a military school student. The client denied having sex with the third person. Of course, the result may not be caused by sex but by blood transfusion or misuse of the needle. School hoped to withhold the event and retest the result. The result of re- examination of blood which was done one week later showed that the previous test was an error. This case was first reported verbally and the whole event was reported through the system after it had been completely investigated.

20. Do you think reporting campus security events may generate hostility towards you

from your colleagues who might regard you as working too closely with senior management?

A1. It has happened that the president of the school intolerant of the military staff who reported the event to the Ministry of Education. We have been communicating with presidents of schools every time we have meeting with them. We told them clearly that those events are unpredictable and hard to control by man power; therefore, it is not their fault when such events happen and they won't be blamed on them. However, if school refuses to report, the president may take the responsibility in law or administrative system. So, we have provides the concept to the president of school. Therefore, as can be said that the acceptability of report the event are accepted by the president of school. The concept has gradually changed in Taichung City this year.

21. According to personal experience, what kinds of event do you think are sporadic events and hard to control? How do you think this condition could be improved?

A1. For example, car accident is more common. Sometimes there are slight collisions with other cars and sometimes there are traffic accidents caused by driving without a licence. The sporadic events normal are more than other event and hard to control. Otherwise, like the event of sex harassment, because it is hard to define. Although we educate the student continually, the problem is the defining of events which causes the uncomfortable feeling to student. It might be normal contact when students were in love but became sex harassment when they broke up. So it is hard to control.

How to improve it?

Firstly, enhance the education training and propaganda for students, especially in notion. For sporadic events which are under our control, we do our best to educate student with correct concept; while for those are not under our control such as nature disaster, we teach student how to handle it and how to protect your-self when it happens.

Nowadays, education tends to educate students many positive but less negative concepts of event. We should also give negative cases as a kind of opportunity education. If students are just given the positive concepts of event, they are probably unable to deal with a contingency they meet. We should provide negative information to them such as drugs abuses and gender relationship. In the past, people ignored such issues, even skipped the course of gender relationship, which

made students more curious about that; therefore, some students tried it without contraception, which resulted in pregnancy and caused more problems to society and family. Moreover, we did not educate the knowledge of drug to students in the past; therefore, some students tried it by mistake. Nowadays, we give a concept to student which shows that it is poisonous, what it looks like and the sequel after taking it. Therefore, I believe that educations with both positive and negative sides will help children make a proper judgment, and it would be more practical.

22. According to personal experience, what kinds of event do you think are happening with frequency and why are they hard to reduce? How do you think this condition could be improved?

A1. At this moment the most injure for students is from traffic accidents. More than one thousand of students were injured in traffic accidents every year. Public transportation in some remote areas is not so convenient; therefore, some students might have no choice but to go to schools by motorcycle without a license. Students are too young to get a driving license and they haven't been trained, so if accidents happen to them, they are usually serious injured. It is really hard to prevent.

So, you think that the car accident which happened by illegal driving of student caused by both the factors of environment and social welfare.

Because of nowadays the law are different than the environment.

So, you think that the low is disconnected from environment.

Yes, it has the condition really.

What function did you think to improve it?

I think that it is hard to improve it, but we still have to do it. Firstly, the government can provide the subsidy to remote areas or establish the traffic system. For example, there is no school bus and less of public bus service in some school but both parents have work and cannot provide the transportation vehicle for them. The simple way is bicycle but it cannot reach the far distance. Therefore, the riding motorcycle may be the alternative way for them. We hope that the law can modify and improve the support on the remote areas. Even provide the subsidy to some school without school bus, or provide the public transportation for student. The government may provide some funding or signing the contract with local bus company which provide the service for student. Nowadays, the targets of public transportation which belong to the private company are focused on the profit. They

will close the service for public if they think it is no profit for them. I think that it is the responsibilities of government. By doing so, it can reduce the car accident of student. Otherwise, the educations also have to focus on education of student and family education of parents together.

23. According to personal experience, what kinds of event do you think are latent ones and hard to predict? How do you think this condition could be improved?

A1. Some latent events can be classified into sporadic events. Generally speaking, the categories of campus event can be control clearly through the annual analysis. Latent events usually related to the factor of environment of schools which surround school, such as old facilities or defective enclosing walls.

Do you think that the environment of community around the school may cause the potential crisis event to students?

Yes, latent events caused by communities around schools are hard to find out but most of events can be predicted and prevented.

What kind of crisis do you think are created by the environment of school?

For example, some sport facilities are so old or in a dilapidated condition that students may get injured when using them. Otherwise, strangers may invade the campus with damaged hedge. The Ministry of Education once promoted a "no fence policy" in Taichung City before. But it happened that a student in special education school was raped by a stranger from off-campus. We cannot expect that the criminal have normal attitude or behaviour as a general person. It is a good thing that school has no hedge, but it also provides a good chance for criminal and offender. Such event is unpredictable.

How to improve it?

Actually, school should do some environment assessment and take some precautionary measures. The environment assessment could be looser if the school is located in a safe and sparsely-populated area. Also, school should maintain and repair the facilities frequently.

I. The other

24. In a technological society, schools rely on technology to help with campus security management; however, sometimes students also use technology to cause some events for campus management, for instance: recording counseling conflict events with mobile phone, posting an undue behavioral video on internet or recklessly send an e-mail to the minster of the Ministry of Education etc.

What is your opinion on this phenomenon?

A1. I think that it can be focused on a few viewpoints. Firstly, about the ban of using mobile phone at schools, t was easier to do when the mobile phone was unpopular in the early time. But now schools have to formulate a regulation for managing the using of mobile phone at schools, including the timing, the place etc; and they should be set on mute or vibration model in class. On one hand using the mobile phone to record voice or take photography will absolutely cause harm to teachers On the other hand it might help stop some inappropriate teachings. Every technical product is good. What is the most important thing is how to enhance the attitude of user.

Firstly, school should manage it. Then schools have to educate student the timing they use it, which is the same as internet. The using of internet also is kind of education which help student establish the concept of law. Some information can be posted to internet, some may not. Users are responsible for their behaviour and all the duty in law. If education focus on this issue and accompany a proper management, the problem could be reduced. The conflict between teacher and student cannot be improved by blindly banning the use of mobile phone at school but get worse. That student using the mobile phone at school may cause harm to school, but also may cause a vigilant function to teacher, so it may not just of negative effects. Mobile phones challenge the social discipline/hierarchy of the school

So, you think that such behaviour from students may change teachers' attitudes?

Yes, it does. The key point is the concept and attitude of students doing such a thing. If they just want to play a practical joke on teachers or ask for troubles, of course, it may cause harm to schools and teachers. However, if the problem comes from the inappropriate teaching of teacher, the posting of even may force teachers to change their attitude on the management of students.

So, you think that technology is helpful for manager?

Yes, but it depends on how you use and manage it.

Appendix XI The sample of translation from multilingual background of researchers

Do you think the system functions effectively with respect to school management?

b.你認為此系統可有效提供學校哪些危機管理功能

這系統我覺得應該是說，第一個他所謂的危機管理是說這個系統除了說可以當時表達說這個學校的校安問題之外，事實上他處理的過程還有經過，都會在上面做一個很詳細的描述，那這些有一些可以做為學校的案例，在危機管理上面是可以提供一些經驗，比如說火災事件、車禍事件、地震、或者是一些重大的校安事件，因為每個學校的行政人員要教育人員他處理的方式不盡相同，那可以藉由校安的整個過程當中提供一些寶貴的經驗給一些曾經甚至沒有處理過這樣的教育行政人員能夠有一個寶貴的參考，這是我覺得一個滿好的地方。

I think the system may, say, firstly about risk management, not only show the specific problem of a campus event but in fact it also describes the details of the event and the process of dealing with it at the school. Those cases can also be the reference for school providing some experience for the management of risks, such as fire, traffic accident events, earthquake, or other serious campus events, because it is the function of every administrative staff to deal with events that could be different. Through the process, the campus system can provide some experience for staff who are working at the educational administrative level of the institution who do not have experience to deal with the event. I think that it is a good function for them.

N 2 MA in Teaching in Chinese

I think the system may say that firstly, it provides the condition of problem of campus event at school which can be classified as risk management. In fact, the detail of event has described on the report clearly, some events can be the reference cases for school and it provided some experience for pass events such as fire, traffic accident event, earthquake, or other serious campus events. Because of the dealing function of every administrative staff is different from person to person, through the system can provide some experience for staff who is working at the educational administrative institution without experiences to deal with event. I think that it is a good function for them.

L 3 MA in Language Learning and Education

What are some crisis-managing functions that the system can provide the school?

First of all, the system can not only narrate the security problems of a school but also describe the process of crisis management. Here are some previous cases, such as fire, car accidents, earthquakes or other major security incidents. Due to the fact that not every staff of the administration has the same way of dealing with crisis or that some even do not have any experience, the administration may have some reference, which is an advantage of the system.

C4 Doctor in Sociology

Firstly, I think in the management of risks，the system is able to provide the up-to-date information about school security problems, elaborating the problems in detail when occurred. In other words, the system is able to manage risks by recording the whole process and then reporting the problems in full description. Considering this, the information about the process of risk occurrence and the description of security problems would be taken as references to provide school for the management of risks, for instance, fire, car accident, earthquake or important incidents that are associated with school securities. In school, administrators may use different strategies or approaches to educating their staff to manage risks. The security system would provide precious information for the staff who are new to learn about the management of risks or who do not have similar experience to cope with risks previously. Regarding this, I think it is rather a good point.

J5 MA in Media

In my opinion the risk management system can first of all shows not just the campus events in this school but actually through the process and procedures of dealing with the event they report a detail description of the event. These can become references for the school and provide experience for risk management, such as fires, car accidents, earthquake or even more serious campus events; because each school’s administrative and teaching staff’s way of dealing will be different. So, through the whole process of dealing with the event, those administrative staffs who have no experiences gain a valuable frame of reference. This, I think, is quite a good aspect of the system.

S5 Steve Harlow, Department of Language and Linguistic Science University of York

What crisis management functions do you think this system might effectively offer to schools?

I think one should say, firstly, what is meant by this system's crisis management means that the system, apart from saying it can immediately express this school's security issues, can also act as a case study for the school, and can offer some lessons as far as crisis management is concerned, such as fire, traffic accidents, earthquakes, or other significant school safety issues, because the way in which it deals with a school's administrative officers and teaching staff is not exactly the same, it can through the whole process of school security offer valuable lessons for educational administrators with no previous dealt experience, providing them with a valuable resource, which I feel is a splendid contribution.

A6 Andrew Watson was appointed as The Ford Foundation Representative for China in July of 1999. From 1991 to 1999, he was Professor of Asian Studies of the Center for Asian Studies at the University of Adelaide and a Co-Director of the University's Chinese Economies Research Center. He was a member of the Board of the Australia China Council under the Department of Foreign Affairs and Trade, Canberra, from 1994 to 1999.

What crisis management functions do you think this system can effectively provide for schools?

In the first place, I feel it must be said that, apart from right away expressing issues of school security, this system's reference to crisis management really means that it has a method for the process of resolving issues. They can all be explained in detail in it. So, some of this can be used as case studies for the school. It can provide some experience for crisis management, such as fires, car accidents, earthquakes or major school security incidents. Since its ways of dealing with each of the school's administrative and educational staff is similar, it can be used to provide some valuable experience for the entire process of school security and a valuable reference for administrative and educational staff with no previous experience. I think this is an excellent aspect.

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